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The Contribution of Financial Aid to the Price of Four-Year Institution Attended by 1989/90 Freshmen

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This conference paper was presented at the *Annual Meeting of the Association for the Study of Higher Education*, held in Memphis, TN, from October 31 - November 3, 1996. It is a National Postsecondary Student Aid Study.

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Abstract
By examining the effects of financial aid upon students' choice of what type of institution of higher education to attend, this study addressed the effectiveness of current student financial aid programs in achieving the goal of equal educational opportunity. The study evaluated a sample of 1,916 students in the first follow-up (1992) of the *Beginning Postsecondary Student Survey of 1989-90* entering freshmen, a subsample of the *National Postsecondary Student Aid Study*. Students' choice of institution to attend was measured by the institutional characteristic of price after controlling for the effects of other student and institutional characteristics. The study's conclusions were: (1) that financial aid enabled students to attend higher-priced institutions, although various types and amounts of aid had different effects upon the price of institution attended; (2) that, unlike the results of prior research, loans were positively related to the price of the institution attended; (3) that financial aid was insufficient to enable students from lower socioeconomic backgrounds and Hispanic students to attend the higher-priced four-year colleges and universities for which they were academically qualified; and (4) that the effects of financial aid upon institutional price varied by race group, since loans were less effective for black students than for students of other race groups.

Keywords
access to education, affirmative action, college choice, college freshmen, college students, equal education, higher education, institutional characteristics, politics of education, public policy, student costs, student financial aid

Disciplines
Education | Educational Sociology | Education Economics | Education Policy | Higher Education | Race and Ethnicity

Comments
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This paper was presented at the annual meeting of the Association for the Study of Higher Education held in Memphis, Tennessee, October 31 - November 3, 1996. This paper was reviewed by ASHE and was judged to be of high quality and of interest to others concerned with higher education. It has therefore been selected to be included in the ERIC collection of ASHE conference papers.

INTRODUCTION

The federal financial aid programs for undergraduate college students that were initially authorized under the Higher Education Act of 1965 and most recently reauthorized in 1992 reflect the ideals of President Truman's 1946 Commission on Higher Education (Fenske, 1983). The Commission's final report included the following statement:

> The swift movement of events and the growing complexity of our national life and of world affairs makes it imperative, at the earliest possible time, to translate our democratic ideal into a living reality; to eliminate the barriers to equality of educational opportunity; and to expand our colleges and universities to insure that the only factors which would limit enrollment are the ability and interest of the prospective students (U. S. President's Commission, 1947, vol. 2, p. 1 as cited in Fife, 1975).

A primary goal of the student financial aid programs authorized under the Higher Education Act is to ensure equal educational opportunity for all academically qualified citizens regardless of their economic status. The extent to which student aid programs achieve this goal depends upon the breadth of the definition of equal opportunity. Originally, equal educational opportunity was interpreted to encompass access for academically qualified and financially needy students to enter postsecondary education. More recently, equal educational opportunity has been interpreted to include not only access to enter postsecondary education but also choice among the variety of American postsecondary educational institutions and persistence through graduation in the institution selected (Fife, 1975; Hansen, 1983; Huff, 1989; Scannell, 1992; Fenske and Gregory, 1994).

Because the Higher Education Act is due to undergo reauthorization again in 1997, it is important to assess the effectiveness of the current student financial aid programs in achieving the goal of equal educational opportunity. This paper may serve as a guide to policymakers during the reauthorization process by examining the effects of financial aid upon one aspect of the contemporary definition of educational opportunity, that is, students' choice of institution to attend. Students' choice of institution to attend is measured by one institutional characteristic: tuition and fees. The descriptive and

multivariate analyses presented in this paper describe the effects of financial aid among a subsample of first-time, full-time freshmen who participated in the 1989/90 National Postsecondary Student Aid Study (NPSAS) and the first Beginning Postsecondary Student (BPS) follow-up in 1992. Because financial aid is only one of the many possible factors that affect students' choice of college or university to attend, the effect of financial aid should be assessed for its influence relative to other factors. Therefore, this paper addresses the following question:

> What is the contribution of financial aid to the price of institution attended by 1989/90 dependent freshmen after controlling for other student and institutional characteristics?

In addition to this introduction, this paper has four sections: 1) examination of the literature regarding student choice of postsecondary educational institution to attend, including a critique of three conceptual frameworks used to examine the effects of financial aid, identification of the factors related to students' choice of institution to attend, and discussion of the limitations of previous research; 2) presentation of the research design, including a statement of the research questions and description of the sample and method for examining the research questions; 3) report of the results and findings of the descriptive and multivariate analyses; and 4) conclusions drawn from the analyses and recommendations for future research.

LITERATURE REVIEW

Hossler, Braxton, and Coopersmith (1989) observed that research on "college choice" covers a range of topics, including the factors related to the total number of students who enroll in college, the factors that influence the decisions of students to attend college, the factors related to the choice of college to attend, the effects of institutional marketing tactics upon college enrollment, and the effects of students' choice of college upon their future educational and occupational attainment. The literature reviewed for this paper focuses upon factors that influence the type of postsecondary educational

institution students choose to attend, with particular attention to research on the role of financial aid. Because financial aid is only one of many possible factors related to choice, the literature review attempts to identify the most important predictors of choice and to assess the extent to which financial aid contributes after controlling for the influence of other factors.

The five purposes of this literature review are: 1) to critically review the conceptual frameworks that have been used to examine student choice of institution to attend; 2) to identify the primary non-financial factors that may be related to student choice of institution to attend; 3) to examine what has been learned from prior research about the effects of financial aid upon student choice; 4) to identify the limitations of prior research in order to capitalize upon the strengths and avoid the pitfalls from the past in designing and conducting a new study of student choice; and 5) to reveal what needs to be learned that has not been adequately explored through prior research.

Conceptual Frameworks Used to Examine Student Institutional Choice

Traditionally, sociological and econometric models have been employed to examine students' college-related decisions (Hossler, et al., 1989). More recently, researchers (e.g., Tierney, 1980; D. Chapman, 1981; Jackson, 1982; Hossler, et al., 1989) have built upon the strengths of sociological and econometric models and proposed social psychological models to examine student choices. More than one hundred research papers, reports, and monographs have employed either or all or component parts of these three models to examine the factors related to student choice of institution to attend.

Sociological models focus primarily upon non-financial factors that influence educational aspirations, such as encouragement from significant others and characteristics of the high school attended, and the subsequent effects of educational aspirations upon educational and occupational attainment. While sociological models are useful for understanding the contribution of educational

aspirations to the decision to enroll in college, they are much less useful than econometric and social psychological models for understanding the influence of financial factors upon student choice of institution to attend. Since econometric models assume that college choices are based upon an assessment of the costs and benefits associated with each alternative, they are more popular than sociological and social psychological models for examining the contribution of financial aid to choice of institution to attend. Although social psychological decision making models are used less frequently than econometric models for examining the effects of financial aid upon institutional choice, they recognize the potential influence of non-financial as well as financial factors, and, consequently, are more comprehensive than both sociological and econometric models.

Sociological Models

Only a few researchers (e.g., Hearn, 1984, 1988) have used sociological models to investigate student choice of postsecondary education institution to attend. Scholars of sociological models generally focus instead upon factors that influence educational attainment, with particular attention to the development of educational aspirations and the relationship of educational aspirations to the decision to attend any college (e.g., Boyle, 1965; Sewell, Haller, and Ohlendorf, 1970; Nelson, 1972; Alwin and Otto, 1977; Falsey and Heyns, 1984; Sewell, Hauser, and Wolf, 1986). Financial aid is generally not included in sociological models. As an example, Hearn (1988) relied upon a sociological framework to construct a causal model for investigating barriers to institutional choice based upon sex, race, and socioeconomic status after controlling for parents' education, family size, high school grades, high school curricular track, test scores, and educational aspirations.[1]

[1] Hearn (1988) argued that if socioeconomic and ascriptive (sex and race) characteristics directly influenced institutional choice after controlling for academic characteristics (e.g., test scores, educational expectations, high school curricular track), the analysis would provide evidence of continued barriers to equity.

The inadequacy of sociological models for examining the factors related to student choice of institution to attend is demonstrated by the percent of the variance in the dependent variable that is typically explained by these models. For instance, among a sample of 1975 freshmen nationwide, student background characteristics (e.g., family income, parents' education, sex, and race) and academic characteristics (high school grades, curricular track, and test scores) explained 37% of the variance in institutional selectivity (measured by average SAT scores of students at the institution), 19% of the variance in institutional resources (measured by educational and general expenditures per undergraduate), and 12% of the variance in institutional tuition and fees (Hearn, 1984). Using a subsample from the High School and Beyond Study of 1980 high school seniors, Hearn (1988) found that student background characteristics and academic characteristics explained just 15% of the variance in institutional tuition and fees. The central variables of sociological models, including family background (e.g., parents' education and income), academic characteristics (e.g., high school performance, academic ability, and high school curricular program), high school characteristics (e.g., student body composition), encouragement of significant others (e.g., teachers, parents, and peers), and educational aspirations, have generally been incorporated into social psychological models of college choice.

Econometric Models

Because econometric models assume that decisions are based upon a comparison of the present value of perceived lifetime benefits with the present value of lifetime costs, econometric models are the most popular for examining the effects of financial aid upon student choice of institution to attend. Under econometric models, the short-term consumption benefits of college attendance include enjoyment of the learning experience, involvement in extracurricular activities, participation in social and cultural experiences, and enhancement of social status, while future benefits include higher lifetime earnings,

more fulfilling work environment, better health, longer life, more informed purchases, and lower probability of unemployment (Bowen, 1980; Leslie and Brinkman, 1988; McPherson, 1993). Assuming that the "household" (i.e., parents and the high school senior) makes decisions related to the student's college attendance, the benefits of investing in postsecondary education also include those realized by parents, such as satisfaction and pride in their child's college attendance in the short-term and their child's enhanced ability to support the parents in future years (Schwartz, 1985). Costs of investing in postsecondary education include direct costs of attendance (e.g., tuition, fees, room, board, books, and supplies) less financial aid, opportunity costs of foregone earnings and leisure, and costs of traveling between home and the institution.

Econometric models assume that individuals make decisions that maximize their welfare with respect to their personal preferences and tastes. When comparing two or more alternatives, a rational individual is expected to select the alternative that maximizes expected utility, where expected utility is the sum of expected current and future utilities (Manski and Wise, 1983; Hossler, et al., 1989; Paulsen, 1990). Individuals are assumed to consider their financial resources, academic achievement and aptitude, and current and expected labor market conditions when determining the relative benefits and costs of investing in postsecondary education. For instance, low levels of financial resources may constrain a family's ability to pay the costs of the investment, low academic aptitude may reduce the probability a student will successfully complete the educational program and acquire a job producing the expected future earnings premium, and an economic recession may reduce future labor market opportunities. Parental income may constrain the parents' investment in a child's education even when government guaranteed loan programs exist, if parents lack information, are adverse to debt, or face limits on the amount of loans available (Taubman, 1989).

Arguing that "whether an individual chooses to go to any particular college depends on the quality of schools he [*sic*] would attend were he [*sic*] to go to college" (p. 70), several researchers (e.g., Nolfi, et al., 1978; Fuller, et al., 1982; Manski and Wise, 1983; and Ozden, 1993) have modeled institutional choice using conditional logit models that assume choice to be among a discrete set of education and non-education alternatives, such as work, military, and homemaking. Education alternatives have included institutions to which the high school senior applied and was accepted, plus local community colleges with open enrollments. According to these models, a student determines whether to attend college and which college to attend based upon an evaluation of the opportunities available with and without a college degree, the costs of attending college, and the characteristics of the preferred institution (Nolfi, et al., 1978; Fuller, et al., 1982; Manski and Wise, 1983; and Ozden, 1993). Manski and Wise (1983) operationalized these premises by estimating a three equation model: one equation for the probability of application, one for the quality of preferred institution, and one for the probability of admission to the preferred institution. Other researchers (Bishop, 1977; Schwartz, 1985, 1986) used binary choice models and assumed that the choice was between the best college and the best non-college alternative. Both Bishop and Schwartz assumed that the best college alternative was the least expensive institution. The extent to which econometric models accurately model student choice of institution to attend is difficult to assess when logit, probit, or logistic regression models are used since the "goodness of fit" measure that is typically reported (log-likelihood) is not easily interpreted.

Two theoretical frameworks designed to enhance the explanatory power of sociological and econometric models are consumer choice (Young and Reyes, 1987) and dual labor market (Gardner, 1987). According to the consumer choice model, educational decisions are a function of the personal resources required, including monetary and non-monetary effort and monetary and non-monetary risk (Young and Reyes, 1987). Monetary costs include tuition less financial aid and are evaluated in terms of

personal wealth. Examples of non-monetary effort are completing the application process and satisfying high school course requirements. One monetary risk is that future earnings will not exceed the costs of the investment. Non-monetary risks include the social and psychological risks of not completing the educational program, the social adjustments associated with entering a new environment, and the loss of contact with family and friends. Since financial aid addresses only monetary costs of attendance, the consumer choice model predicts that educational choices will reflect differences in perceived non-monetary costs, differences that are attributable to cultural, social, and psychological factors as well as types and sources of information available (Young and Reyes, 1987). According to the dual labor market theory, certain subgroups, such as blacks, Hispanics, and women, expect restricted post-schooling opportunities due to race and sex discrimination in the labor market. This theory predicts that, if occupational aspirations depend upon expected labor market opportunities and if occupational aspirations affect educational choices, then those who expect fewer opportunities because of their race or sex may be less willing to attend more expensive colleges and universities (Gardner, 1987).

In summary, econometric models predict that student choice of institution to attend is determined by educational costs (e.g., tuition and fees less financial aid, room and board, and distance from home), foregone earnings, financial resources, the student's academic ability relative to the average academic ability of students attending the institution, high school preparation, characteristics of alternatives, and expected future earnings.

Social psychological Models

Researchers who have used social psychological models (e.g., Jackson, 1978, 1982; Dembowski, 1980; Hossler and Gallagher, 1987) have generally identified three stages in the choice process: 1) predisposition toward attending college, aspiration for attending college, and interest in attending

college; 2) search for information about various colleges and consideration and elimination of alternatives; and 3) selection of one college to attend based upon a rating and ranking of each alternative. This study focuses upon the third stage in the process: choice of institution to attend.

During the third stage, a student's choice of institution is influenced by the institutions in the choice set, the student's preferences, and the student's perceptions of the institutions in the choice set (Hossler and Gallagher, 1987). Social psychological models focus upon the "fit" between a student's perceptions about and the actual characteristics of an institution (Hossler, et al., 1989; Paulsen, 1990). A student is expected to select the postsecondary educational institution with characteristics perceived to be best-suited to his or her own attributes. Based upon his review and synthesis of prior research, David Chapman (1981) developed a model of student college choice in which student characteristics (e.g., socioeconomic status, aptitude, high school performance, and educational aspirations) and external factors (e.g., encouragement of significant others, high school quality, institutional characteristics, and institutional efforts to communicate with the student) interact to mediate choice.

What are the non-financial factors that influence choice of institution to attend?

Prior research shows that the most important predictors of student choice of institution to attend are: academic ability and achievement, institutional quality, parental encouragement, and educational aspirations. A student's SAT score has been shown to be the single most important predictor of institutional choice (Manski and Wise, 1983; Zemsky and Oedel, 1983; Hearn, 1984; Ozden, 1993). Pre-college academic achievement has been shown to be positively related to institutional quality (Jackson, 1978; Manski and Wise, 1983; Zemsky and Oedel, 1983; Ozden, 1993), but individuals generally self-select into institutions that enroll students with ability levels similar to their own level (Spies, 1973; Nolfi, et al., 1978; Fuller, et al., 1982; Manski and Wise, 1983; Seneca and Taussig, 1987). In addition to

interacting with academic ability, institutional quality has also been found to have a direct effect upon student choice of institution to attend. Prior research shows that students generally prefer to attend private four-year rather than public two-year institutions (Fuller, et al., 1982) and higher rather than lower quality institutions (R. Chapman, 1979; Dembowski, 1980; Tierney, 1980; Seneca and Taussig, 1987; DeMasi, 1989; Spielvogel, 1992).

Prior research also reveals that parents' preferences and aspirations for their children's education are positively related to the choice of institution to attend (Jackson, 1978; Welki and Navartil, 1987). Parental education, a proxy for parental encouragement, has been found to be less influential than SAT score, but more important than parental income (Manski and Wise, 1983; Zemsky and Oedel, 1983; Hearn, 1988; Ozden, 1993). The specific institution attended by their parents (i.e., "parental legacy") has been shown to be positively related to institutional choice in single institution studies (Willingham and Breland, 1982; Seneca and Taussig, 1987), but not in studies using nationally representative samples of students (e.g., Chapman and Jackson, 1987). Parental encouragement is not related to student choice of institution to attend when defined as parents' willingness to contribute more money than expected (as determined by the federal needs analysis formula) in order for their child to attend a higher quality institution (DeMasi, 1989).

Although only a few researchers (e.g., Zemsky and Oedel, 1983; Hearn, 1984, 1988) have examined the effect of students' educational aspirations upon their choice of institution, these researchers have found that students with higher educational aspirations preferred to attend more selective and more expensive institutions. Hearn (1988) found that, among a subsample from the High School and Beyond Study of 1980 high school seniors, educational expectations had the second largest total effect, after test scores, upon institutional cost after controlling for socioeconomic characteristics, sex, and race.

Only a few researchers (e.g., Manski and Wise, 1983; Ozden, 1993) have examined the effects of high school quality upon student choice of postsecondary educational institution to attend. Manski and Wise (1983) and Ozden (1993) found that the quality of the postsecondary institution selected increased with the quality of high school attended, but the effect was smaller in magnitude than the effects of SAT score and high school rank.

The effects of race and sex upon students' institutional choice are ambiguous. Some research suggests that differences in the selectivity of the institution to which students of different race groups applied declined between 1972 and 1982 (Manski and Wise, 1983; Ozden, 1993). Other researchers (Hearn, 1988) have shown that the positive direct effect of being black upon institutional cost was entirely offset by the negative indirect effect of being black upon high school rank and SAT score (Hearn, 1988). Studies of the effect of race upon institutional choice are limited by the application of descriptive statistics only (e.g., Muffo, 1987), the use of non-representative samples (Hearn, 1984), the reliance upon samples drawn from single institutions (e.g., Somers and St. John, 1993), the omission of race from the analyses (e.g., Chapman and Jackson, 1987), and the general lack of attention to race groups other than whites and blacks.

Some evidence suggests that men preferred higher quality institutions than women in the early 1970's (e.g., Manski and Wise, 1983; Hearn, 1984), but that men and women in the early 1980's did not differ in their choice of institution to attend (e.g., Hearn 1988) or that women preferred higher quality institutions than men (Ozden, 1993). But, regardless of its direction, prior research generally shows that the effect of sex upon institutional quality is smaller in magnitude than the effects of SAT score, high school rank, parental education, and high school quality (Manski and Wise, 1983; Ozden, 1993).

The effect of labor market conditions and opportunities upon student choice of institution to attend is unclear from prior research. Researchers who have modeled institutional choice as a choice

between at least two postsecondary educational institutions generally have not controlled for labor market conditions and opportunity costs (e.g., Jackson, 1978; Hearn, 1984, 1988; Chapman and Jackson, 1987). Researchers who have defined the choice to be between the "best" college and the "best" non-college alternatives have included these factors (e.g., Bishop, 1977; Nolfi, et al., 1978; Fuller, et al., 1982; Manski and Wise, 1983; Schwartz, 1985), but have shown that labor market conditions are both related (e.g., Bishop, 1977; Nolfi, et al., 1978; Fuller, et al., 1982; Manski and Wise, 1983) and unrelated (Schwartz, 1985) to student choice.

Finally, although several researchers have found that visiting an institution's campus was positively related to institutional choice (Dembowski, 1980; Willingham and Breland, 1982; King, et al., 1986; Chapman and Jackson, 1987), the causal order of institutional recruitment activities and institutional choice is unclear. Participating in recruitment activities may cause an individual to attend an institution but an individual may participate in institutional recruitment activities because he or she is already inclined to choose the institution.

What is the contribution of financial aid to student choice of institution to attend?

Both descriptive (e.g., Muffo, 1987; Cockriel and Graham, 1988; Annis and Rice, 1993) and multivariate analyses (e.g., Nolfi, et al., 1978; Fuller, et al., 1982; Manski and Wise, 1983; Tierney, 1980; Tierney and Davis, 1985) have shown that financial aid and cost are influential dimensions of student choice of institution to attend. The review of the literature has also shown that receiving financial aid is particularly effective in promoting choice for lower income students (Jackson, 1978; Seneca and Taussig, 1987; Leslie and Brinkman, 1988; Healy, 1991; Healy and Jellema, 1991), likely due to the need-based eligibility criteria for most financial aid. Increases in net price were found to

reduce the probability that financial aid applicants would choose to attend an institution, but did not affect non-financial aid applicants' choice (R. Chapman, 1979; Moore, et al., 1991).

Nonetheless, prior research has also shown that, although financial aid has promoted institutional choice, financial aid has not eliminated economic barriers to choice. Previous research generally indicates that, after controlling for student characteristics, financial aid enables recipients to attend institutions that are more selective (Shaut and Rizzo, 1980), more expensive (Leslie and Brinkman, 1988; Flint, 1991), and private rather than public (Leslie and Brinkman, 1988). But, while financial aid may enable students to consider a less homogeneous set of institutions (Munday, 1976; Flint, 1991), the amount of aid awarded has been found to be insufficient to eliminate financial barriers to choice (Zollinger, 1984). Moreover, the probability of enrolling (Schwartz, 1985, 1986; St. John, 1991), as well as the prestige and selectivity of the institution preferred (Spies, 1973; Zemsky and Oedel, 1983; Manski and Wise, 1983; Hearn, 1984; MacDermott et al., 1987; Flint, 1992; Ozden, 1993), has been shown to increase with parental income. According to Schwartz (1985, 1986), the positive relationship between parental income and student choice even after controlling for financial aid shows that choice is not "wealth neutral," where wealth neutrality is defined as equal probability of choosing to attend an institution, regardless of income, among students who are equally qualified.

The literature reviewed for this paper also shows that the effects of the amounts, types, combinations, and sources of financial aid upon choice of institution to attend are ambiguous, especially given the changes in financial aid programs over time. While some researchers have found that the probability of enrolling in one institution rather than in another increased with the amount of aid received (Seneca and Taussig, 1987; Somers, 1993; Healy, 1991; Healy and Jellema, 1991), other researchers have shown that merely receiving financial aid, rather than the amount of financial aid received, influenced students' choice (Jackson, 1978; St. John, 1991). While researchers who examined choice of institution

to attend among high school seniors in the 1970s have found that grants, loans, and work study have comparable-sized, positive effects upon choice (Nolfi, et al., 1978; Tierney, 1980), researchers who have examined choice among students in the 1980s have found that grants, but not loans, promote choice (Schwartz, 1985; Chapman and Jackson, 1987; Jackson, 1990; Moore, et al., 1991). Moreover, although some evidence suggests that institutionally funded financial aid is more effective in promoting choice than need-based financial aid (Chapman and Jackson, 1987; DeMasi, 1989; Somers, 1993), few researchers have specifically examined the effects upon choice of different sources of financial aid (e.g., federal government, state government, or institution).

Finally, the extent to which the effects of financial aid upon student choice of institution to attend vary by race group has not been well established by prior research. While financial aid in the form of grants has been found to be especially effective in promoting choice for lower income students (Chapman and Jackson, 1987; Schwartz, 1986) and black students (Jackson, 1990), further research is needed to better understand the effects of the amounts, types, sources, and combinations of financial aid upon the choices of black and Hispanic students.

How confident can researchers and policymakers be in the findings of prior research?

The research reviewed for this study is subject to six major limitations. First, research regarding the effects of financial aid upon student choice of institution to attend is limited by the reliance upon unreliable sources of information about financial aid awards. Prior to 1986/87 when the U.S. Department of Education conducted the first National Postsecondary Student Aid Survey (NPSAS), no national student aid database existed. Consequently, researchers generally relied upon their own surveys of students and students' self-reported and unverified income and financial aid data. A number of researchers omitted measures of financial aid from their analyses of student choice of college to attend

(e.g., Spies, 1973; Kohn, et al., 1976; Munday, 1976; Hearn, 1984; King et al., 1986; Post, 1990; Spielvogel, 1992). Other researchers did not consider financial aid separately from costs of attendance but included an aggregate measure of net price (e.g., Tierney and Davis, 1985) or measured an individual's attitude about the cost of an institution (e.g., Welki and Navratil, 1987; Trusheim et al., 1990). As a result, the relative effects of cost and financial aid upon choice are ambiguous.

Second, prior research on student choice of institution to attend is limited by the preponderance of single institution studies. Single institution studies are constrained by restricted variance in some variables (e.g., students' family income), their failure to examine the potentially important effects of institutional characteristics (e.g., size, selectivity, cost) upon educational outcomes, and their limited generalizability due to differences in institutional characteristics and policies.

A third limitation pertains to the relevance of prior research to today's college students, given the changes in financial aid policies and programs over time, particularly in terms of eligibility requirements and the types and amounts of aid available. Few researchers have examined the choice of institution to attend among a nationally representative sample of students entering college after 1982. Given the changing nature of financial aid programs as well as changes in other social, demographic, and economic factors over time, the relevance of prior findings is likely restricted to the time period investigated. Moreover, although policymakers (e.g., Stafford, 1987) and researchers (e.g., Fenske and Barberini, 1992; Fenske and Gregory, 1994) have expressed concern over the shift in federal student aid from grants to loans during the 1980's, few researchers have examined the effects of this shift upon student choice of institution to attend. This is particularly important since several researchers (e.g., Olson and Rosenfeld, 1984; Ekstrom, 1991; Steelman and Powell, 1991) have shown that an aversion to borrowing restricts institutional choice and that those of lower socioeconomic status are less willing to borrow.

A fourth limitation pertains to the lack of attention in prior research to the effects of financial aid upon institutional choice among students of different race groups. Studies of the effect of race upon institutional choice are subject to several limitations (e.g., descriptive statistics only, non-representative samples and samples from single institutions, and omission of race from the analyses). Furthermore, consumer choice and dual labor market theories, two variations of the econometric theory of decision making, predict that black and Hispanic students make different college choices than white students. According to the consumer choice theory, variations in cultural, social, and psychological factors may affect students' assessment of non-monetary risks (Young and Reyes, 1987). According to the dual labor market theory, blacks and Hispanics may perceive less attractive labor market opportunities after college graduation (Gardner, 1987). Consequently, in order to ensure that the benefits of college attendance exceed the costs, black and Hispanic students may choose to attend less expensive higher education institutions than white students.

The fifth limitation pertains to the methodological problems associated with the research design. These problems include the use of ordinary least squares regression with a dichotomous outcome and the omission of some of the variables predicted by sociological, econometric, and social psychological conceptual frameworks to be related to choice of institution to attend.

Finally, econometric models posit that an individual makes a decision (e.g., choice of institution to attend) by weighing the benefits against the costs for all possible alternatives and then selecting the alternative with the greatest net benefit, given the individual's personal tastes and preferences. But, the results of studies using econometric models may be limited by the questionable validity of the following assumptions: individuals are "rational actors" with perfect information; individuals are risk neutral; individuals accurately estimate expected foregone and future earnings; and the decision making unit is comprised of parents and the student rather than the student only.

How can knowledge about the contribution of financial aid to student choice of institution to attend be enhanced through additional research? Based upon methods employed in prior research, how should further research be designed?

The research design presented in the next section builds upon the findings of previous research while taking into account the limitations in at least five respects. First, although the federal government spent $37.365 billion on financial aid in 1995/96, the effects of financial aid, including the effects of the amount, types, sources, and combinations of aid, upon student choice of institution to attend are unclear. Periodically determining the effects of financial aid upon institutional choice is especially important given the recurring reauthorization of the Higher Education Act every five years. For this study, a subsample from the Beginning Postsecondary Student Survey (BPS) first follow-up, the most recent nationally representative database with reliable financial aid data, is used to examine the research question. The BPS database includes the best available information on the amounts, types, and sources of financial aid received, students' family income and financial need, and tuition and fees at the institution attended. Therefore, this study will guide policymakers during the reauthorization by demonstrating the effects upon institutional choice among 1989/90 freshmen nationwide of receiving any financial aid as well as receiving different types, sources, amounts of aid, and combinations of aid.

Second, the BPS database includes sufficiently large sample sizes to examine the effects of financial aid for three race groups: whites, blacks, and Hispanics. To more fully examine variations in the effects of financial aid among different groups, interactions between financial aid and race group, as well as between financial aid and socioeconomic status, are included in the analyses.

Third, the BPS database is representative of 1989/90 freshmen nationwide and, therefore, is not limited to students at one institution. Unlike single institution studies, this study explicitly incorporates

the diversity of institutions from which a student chooses into the dependent variable: tuition and fees at the institution attended.

Fourth, the regression model presented in the research design avoids two common problems found in previous research. First, the model utilizes a continuous dependent variable (tuition and fees at the selected institution), thereby avoiding the methodological problem of using ordinary least squares regression with a dichotomous outcome (e.g., enroll at the institution: yes or no). Second, the independent variables are drawn from sociological, econometric, and social psychological conceptual frameworks, thereby avoiding the questionable validity of the assumptions underlying econometric models.

Finally, the findings from this study will guide future research on the factors that influence student choice of institution to attend by identifying the questions that need to be asked in future research and the aspects of the college choice process that are not adequately addressed using the BPS database. In addition, this research will be used to inform the U. S. Department of Education about the strengths and weaknesses of the BPS database. The U. S. Department of Education has invested substantial resources into the development and maintenance of national databases such as the BPS. Because this database is superior to most others in turns of the representativeness of the sample, the minimization of missing data, and the reliability of the data, researchers should use the database to identify necessary refinements and improvements. By informing the U. S. Department of Education of these strengths and weaknesses, future data collection activities may be altered in ways that better serve the needs of educational researchers, and, consequently, of educational policymakers.

RESEARCH DESIGN

Descriptive and multivariate analyses are used to examine the effects of financial aid upon price level (tuition and fees) at the institution selected by first-time, full-time dependent freshmen who first enrolled at a four-year college or university in the 1989/90 academic year and who were attending their first-choice institution. The sample is representative of freshmen nationwide and is drawn from the Beginning Postsecondary Student Survey, first follow-up in 1992. The analyses rely upon a social psychological framework that has been expanded to include race and sex, two key variables in sociological models, and a proxy for labor market conditions and opportunities, an important variable in econometric models. In order to determine the effects upon institutional price of different amounts, types, sources, and combinations of financial aid, the analyses are repeated using seven different measures of financial aid.

The five purposes of this section are: 1) to present the research question addressed; 2) to describe the sample of students examined, including the database from which the sample is drawn and the criteria for selecting the sample; 3) to specify the analyses employed to address the research question; 4) to present the dependent and independent variables included in the analyses; and 5) to assess the limitations of the research design.

Research Question

Based upon the conclusions drawn from the literature review, particularly the uncertain contribution of different amounts, types, and sources of financial aid to students' choice of institution to attend, the most important question to be addressed is:

> What is the contribution of financial aid to the price of the institution attended by 1989/90 dependent freshmen after controlling for other student and institutional characteristics?

Sample

Database from which the Sample is Drawn

A subsample from the first follow-up to the Beginning Postsecondary Student Survey (BPS) is used to address the research question. Sponsored by the U.S. Department of Education's National Center for Education Statistics, the BPS is intended to provide data regarding postsecondary students' persistence, progress, and attainment from initial enrollment in postsecondary education through departure. While several databases were considered for this study, the BPS was judged to be superior for two reasons. First, the BPS is representative of all students nationwide who began their postsecondary education in 1989/90, regardless of the type of institution attended. The BPS includes data from 7,932 undergraduates who first entered a postsecondary educational institution in 1989/90 and who responded to the 1990 National Postsecondary Student Aid Study (NPSAS) and the BPS first follow-up in the spring of 1992. The NPSAS includes undergraduate, graduate, and first-professional students who were enrolled at any time during the 1989/90 academic year in less than two-year, two-year, and four-year postsecondary educational institutions in the fifty states, the District of Columbia, and Puerto Rico. Both recipients and non-recipients of financial aid are represented. In the 1989/90 academic year, data were gathered from the records of 1,130 postsecondary institutions on 69,000 students and from computer-assisted telephone interviews of 51,400 postsecondary students and 16,000 parents. The overall response rate for the first BPS follow-up was 91% and the average student interview was between 40 and 45 minutes (Burkheimer, et al., 1994). The BPS database includes data from institutions (e.g., type, control, tuition and fees), students (e.g., major field, financial aid, and educational aspirations), and parents (e.g., income, education, and amount of financial support provided to the child).

A second advantage of the BPS database pertains to the reliability of the financial aid data. Because the BPS uses a subsample of students who participated in the NPSAS:90, the BPS database

includes the best available data on the amounts, types, and sources of financial aid students received, students' family income and financial need, and the components of the cost of attendance. For the NPSAS:90, financial data were collected from students, parents, and institutions in order to increase the reliability of the data and to minimize the amount of missing data. A disadvantage of some other databases is that financial aid data are obtained only from students even though students may not be fully informed or may not correctly recall the exact amounts and sources of financial aid received.

Criteria for Selecting the Sample

The subsample used for this study includes only students who meet the following criteria: initially enrolled in a bachelor's degree program at a four-year college or university on a full-time basis, American citizen, dependent (as defined by financial aid eligibility criteria), and enrolled in their first-choice institution. Students who were enrolled less than full-time and who were not American citizens qualified for different sources, types, and amounts of financial aid than other students, and therefore, are excluded from the analyses. Students who chose an institution of two years or less and who were not enrolled in bachelor's degree programs likely differed from other students in terms of their preference for commuting, their educational and career aspirations, and their certainty about major field and career goals. Students with a "flag" in the BPS database noting questionable data are also excluded from the analyses. Because the BPS database does not include data describing the prices of alternative institutions from which students were choosing, only students who were attending their first-choice institution are included in the analyses.

Analysis

The procedures for this study involved securing a raw data file from the U.S. Department of Education to create a sub-file designed specifically to address the research question. In order to ensure

that the sample is representative of the population of dependent, full-time, first-time 1989/90 freshmen at four-year institutions who were attending their first-choice while also correcting for the influence of large sample sizes on standard errors and t-statistics, each case is weighted by the sample weight (BPS92AWT) divided by the average weight for the sample (394.009). The size of the unweighted sample is 1,916, the size of the weighted sample is 474,252, and the size of the adjusted weighted sample is 1,204. The students in the subsample attended 353 different four-year colleges and universities.

Descriptive and multivariate analyses are used to address the research questions. At the descriptive level, analysis of variance and chi-square tests are used to identify differences in the college choice processes among students of different race groups and differences in the amounts, types, sources, and combinations of financial aid received by freshmen with various characteristics (e.g., sex, race, socioeconomic status, and institutional characteristics). Ordinary least squares regression is used for the multivariate analyses. The multivariate analyses are designed to isolate the effects of financial aid upon institutional price (the dependent variable) after controlling for other factors predicted by previous research to be related to price.

In order to more fully examine the effects of financial aid upon institutional choice, the multivariate analyses are repeated using each of seven different measurements of financial aid:

- Any financial aid received.
- Ratio of the total amount of aid received to the total cost of the institution attended. In order to test whether the relationship is linear, four categories are used: 1) 25.0% or less, 2) 25.1% to 50.0%, 3) 50.1% to 75%, and 4) 75.1% or more.
- Package of financial aid received: 1) grants only, 2) loans only, 3) grants and loans only, 4) grants, loans, and work study, or 5) other package of aid.
- Different types of aid received: grants, loans, and/or work study.

- Emphasis of the aid package on a particular type of aid: grants represented 51% or more of total aid received, loans represented 51% or more of total aid received, or neither grants nor loans were dominant.
- Different sources of aid received: federal Title IV, state, and/or institutional.
- Emphasis of aid package on particular source of aid: federal Title IV aid, state aid, or institutional aid represented 51% or more of total aid received, or no source was dominant.

In each of the seven specifications, the effects of financial aid are evaluated relative to receiving no financial aid. In other words, receiving financial aid is the reference category, and, therefore, is omitted from the multivariate analyses.

Variables

Dependent Variable

Institutional choice (i.e., the dependent variable) is measured by the total tuition and fees charged at the institution attended in 1989/90 (i.e., the "list price"). Tuition and fees is measured as a natural logarithm so that each unstandardized regression coefficient represents the percent change in tuition and fees associated with a one unit change in each independent variable.

Independent Variables

Figure 1 shows the hypothesized predictors of tuition and fees at the institution attended. The model in Figure 1 is based upon David Chapman's (1981) social psychological model and has been modified to reflect the relationships identified in the review of prior research as well as the variables available in the BPS database. The model includes the addition of race and sex, two variables examined in Hearn's (1984, 1988) sociological model, and labor market conditions and opportunities (as measured

by major field), an important variable in econometric models. As described in the literature review, the effects of race, sex, and labor market conditions and opportunities upon student choice of institution to attend are equivocal. The line between socioeconomic status and financial aid in Figure 1 represents the possibility that lower income students respond differently to financial aid than upper income students (e.g., Jackson, 1978; Schwartz, 1986; Seneca and Taussig, 1987; Leslie and Brinkman, 1988; Healy, 1991). Socioeconomic status may also affect choice directly (Spies, 1973; Zemsky and Oedel, 1983; Manski and Wise, 1983; Hearn, 1984; Schwartz, 1985, 1986; MacDermott, et al., 1987; Flint, 1992; Ozden, 1993). Students who aspire to earn an advanced degree rather than to end their education with a bachelor's degree are expected to prefer more expensive institutions (Zemsky and Oedel, 1983; Hearn, 1984, 1988). Prior research has shown that students with higher pre-college academic achievement generally prefer higher quality institutions (Jackson, 1978; Manski and Wise, 1983; Zemsky and Oedel, 1983; Ozden, 1993) and that a student's SAT score may be the single most important predictor of the selectivity of the institution attended (Manski and Wise, 1983; Zemsky and Oedel, 1983; Hearn, 1984; Ozden, 1993). Highest level of education received by a student's parents, a proxy for parental encouragement, is expected to influence institutional choice, since parents may shape their children's perceptions of an institution, offer advice regarding their children's choice, and serve as role models (Jackson, 1978; Welki and Navratil, 1987). Institutional characteristics predicted to be related to price include type and control (Fuller, et al., 1982) as well as location (i.e., in-state or out-of-state). Table 1 summarizes the characteristics of the independent variables used in the descriptive and multivariate analyses, including the number of cases, the minimum and maximum values, the means, and the standard deviations.

FIGURE 2

PREDICTORS OF TUITION AND FEES AT THE INSTITUTION ATTENDED

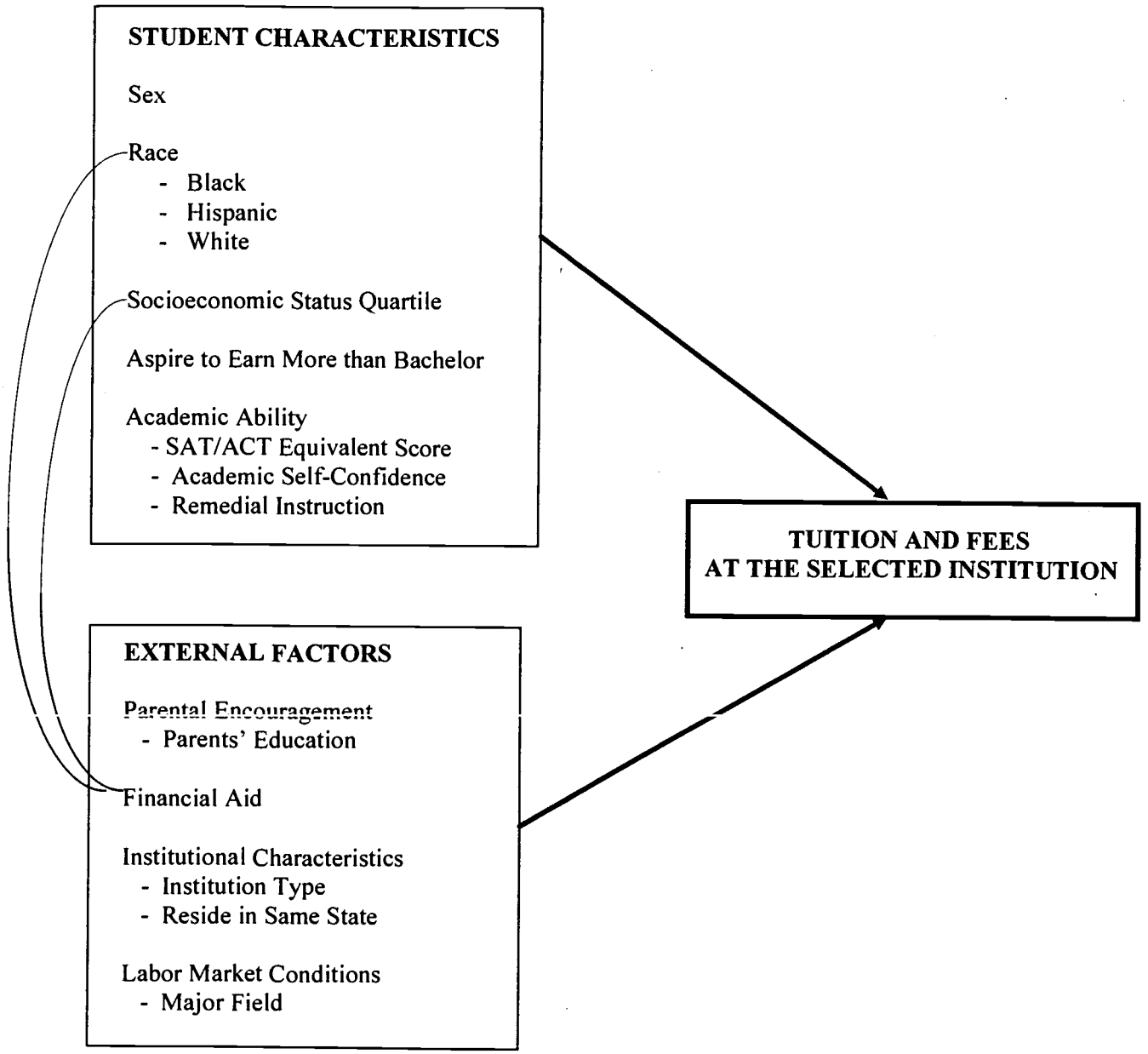

Table 1. Variables Used in the Descriptive and Multivariate Analyses

Variable	N	Range	Minimum	Maximum	Mean	Std. Deviation
Tuition and Fees	1,202	24,517	113	24,630	4,563.68	4,152.12
LN(Tuition & Fees)	1,202	5.38	4.73	10.11	8.03	0.91
Female	1,204	1	0	1	0.54	0.50
Black	1,204	1	0	1	0.06	0.24
Hispanic	1,204	1	0	1	0.04	0.20
Asian American	1,204	1	0	1	0.02	0.16
Lowest SES Quartile	1,204	1	0	1	0.30	0.46
Second SES Quartile	1,204	1	0	1	0.21	0.40
Third SES Quartile	1,204	1	0	1	0.27	0.45
Mother's Education	1,183	4	1	5	2.90	1.07
Father's Education	1,155	4	1	5	3.19	1.25
SAT/ACT Equivalent Score	1,202	1070	470	1540	942.2	168.4
Academic Self-Confidence	1,201	5.80	-3.60	2.20	0.00	1.00
Had Remedial Instruct.	1,204	1	0	1	0.13	0.33
Aspire to More than Bachelor's	1,177	1	0	1	0.63	0.48
Liberal Arts Major	1,204	1	0	1	0.24	0.43
Pre-Professional Major	1,204	1	0	1	0.24	0.42
Occupational Major	1,204	1	0	1	0.22	0.41
College not University	1,204	1	0	1	0.52	0.50
Public, not Private	1,204	1	0	1	0.63	0.48
In-State Institution	1,203	1	0	1	0.77	0.42
Aidratio: 25% or less	1,204	1	0	1	0.13	0.34
Aidratio: 25.01% to 50%	1,204	1	0	1	0.14	0.35
Aidratio: 50.1% to 75%	1,204	1	0	1	0.13	0.34
Aidratio: 75% or More	1,204	1	0	1	0.18	0.39
Received Grant	1,204	1	0	1	0.48	0.50
Received Loan	1,204	1	0	1	0.31	0.46
Received Work Study	1,204	1	0	1	0.13	0.33

Table 1. Variables Used in the Descriptive and Multivariate Analyses

Variable	N	Range	Minimum	Maximum	Mean	Std. Deviation
Grants = 51% or More	1,204	1	0	1	0.34	0.47
Loans = 51% or More	1,204	1	0	1	0.11	0.32
Neither Grants/Loans Dominant	1,204	1	0	1	0.12	0.33
Received Only Grants	1,204	1	0	1	0.21	0.40
Received Only Loans	1,204	1	0	1	0.05	0.22
Received Grants, Loans, & Work	1,204	1	0	1	0.08	0.27
Received Grants & Loans	1,204	1	0	1	0.16	0.37
Received Other Aid Package	1,204	1	0	1	0.09	0.28
Received Title IV Aid	1,204	1	0	1	0.40	0.49
Received Institution Aid	1,204	1	0	1	0.33	0.47
Received State Aid	1,204	1	0	1	0.28	0.45
Title IV = 51% or More	1,204	1	0	1	0.26	0.44
State Aid = 51% or More	1,204	1	0	1	0.06	0.23
Institution Aid = 51% or More	1,204	1	0	1	0.15	0.35
No Source Dominant	1,204	1	0	1	0.13	0.33

One-third (33%) of the cases are missing data for either SAT or ACT score. Using chi-squares and analysis of variance tests shows that, with the exception of race group, students with SAT or ACT scores are similar to students who are missing this data. A higher percent of black and Hispanic students than white students are missing SAT and ACT scores.

For the descriptive and multivariate analyses, the available ACT scores are converted to SAT scores. When both SAT and ACT scores are available, the higher score (i.e., either the actual SAT score or the SAT equivalent of the ACT score) is used. For students who are missing both SAT and ACT scores, the average SAT/ACT equivalent score for students of the same socioeconomic status quartile

and race group is used. Using the mean SAT/ACT equivalent scores for the missing cases minimizes the amount of missing data, and, as a result, maintains the sample size for the multivariate analyses. Imputing the SAT/ACT score based upon both socioeconomic status and race is especially important since blacks and Hispanics are more likely to be missing this data and because an analysis of variance test shows that average SAT/ACT scores vary by socioeconomic status and race group.

In addition to SAT/ACT score, academic self-confidence and participation in remedial instruction are also included as proxies for academic preparation. Factor analysis is used to construct a parsimonious measure of students' academic self-confidence from three items in the NPSAS:90 survey instrument. Because the factor is negatively skewed, the factor is transformed to more closely approximate a normal distribution.

Major field is included as a proxy for expected future earnings and is measured using four dummy variables representing pre-professional major (i.e., highest expected future earnings), occupational major, liberal arts major, and undecided. "Undecided" is omitted from the analyses to serve as the comparison group.

In order to minimize potential collinearity between socioeconomic status and financial aid, socioeconomic status is recoded into quartiles. Interactions between socioeconomic status and each financial aid variable are included to test whether the effects of financial aid vary based upon socioeconomic status. Interaction terms are also included for two race groups (black and Hispanic) and each financial aid variable to test whether the effects of financial aid vary by race group. Interactions for Asian American/Pacific Islander and financial aid are omitted due to the small number of Asian American/Pacific Islanders in the sample (adjusted weighted sample size = 30).

Limitations

This study has four limitations: 1) restricted examination of race and ethnic group differences; 2) omission of some hypothetically important predictors from the analyses; 3) use of cross sectional data to examine the effects of financial aid upon choice of institution to attend; and 4) failure to examine the effects of financial aid and financial need upon application decisions.

First, although the analyses examine differences in college choice for black, Hispanic, Asian American/Pacific Islander, and white students, the use of broad race groups, particularly for Hispanics and Asian American/Pacific Islanders, necessarily masks the diversity of student experiences within these categories. Moreover, because of the relatively small representation of Asian American/Pacific Islanders (2.5%) in the sample, interactions between Asian American/Pacific Islander and financial aid are omitted from the multivariate analyses. American Indian/Alaskan Natives are not examined, since American Indian/Alaskan Natives represent only 0.8% of the sample.

Second, this study is limited by the omission of some hypothetically important predictors from the analyses. Specifically, because they are not included in the BPS database, some of the variables predicted by sociological models to be related to institutional price are not controlled, such as high school achievement (e.g., high school rank, high school grades), high school quality (e.g., percent minority, average SAT score, percent going to college), high school experiences (e.g., curricular track, extracurricular activities), and encouragement of significant others because these variables are not included in the BPS database.

To compensate for the absence of high school grades and high school rank from the BPS, several measures of pre-college academic achievement (e.g., individual SAT score, academic self-confidence, and whether participated in remedial instruction) are included in the analyses. Researchers (Manski and Wise, 1983; Zemsky and Oedel, 1983; Hearn, 1984; Ozden, 1993) have found that student SAT score

may be the single most important predictor of the selectivity of the institution attended. The omission of a proxy for high school characteristics appears to be inconsequential, since two studies that used nationally representative samples of high school seniors found that the quality of the institution selected increased with high school quality, but the effect was smaller in magnitude than the effects of SAT score and high school rank (Manski and Wise, 1983; Ozden, 1993). The highest level of education attained by the student's parents serves as a proxy for parental encouragement and parental expectations for the student.

Some variables predicted by econometric studies, such as students' perceptions of foregone earnings, alternative opportunities, and future earnings, are also absent from the BPS database. Because few studies of student choice have controlled for these variables, the implications of this omission are unclear. The probability of choosing the best college alternative over the best non-college alternative has been shown to decrease as opportunity costs (e.g., local wages) increased among male 1960 high school juniors (Bishop, 1977) and among 1972 high school seniors (Nolfi, et al., 1978; Fuller, et al., 1982; Manski and Wise, 1983) after controlling for institutional and student characteristics. But, among a subsample from the High School and Beyond Study of 1980 high school seniors, future earnings (measured as the present value of the difference between estimated college and non-college future income streams) were not related to the probability of selecting the least expensive college alternative over full-time labor force participation after controlling for parental income and education, direct costs, financial aid, distance, sex, race, and region (Schwartz, 1985). Students' major field is used as a proxy for expected future earnings.

A third limitation is the use of cross-sectional data to examine the effects of financial aid upon student choice of institution to attend. Although the BPS is a longitudinal database, the data that describe institutional choice are cross-sectional, collected as part of the NPSAS:90. With the exception of the

four-year longitudinal study of students who attended 21 high schools in Indiana conducted by Don Hossler and his colleagues, most researchers have used data collected at one point in time to examine student choice. In the absence of longitudinal data, however, the causal order of perceptions, preferences, and choice cannot be ascertained, as illustrated most clearly by attempts to examine the effects of institutional recruitment activities upon student choice of institution to attend (e.g., Dembowski, 1980; Chapman and Jackson, 1987; Kellaris and Kellaris, 1987). Additionally, as with some single institution studies (e.g., Healy, 1991; Somers, 1993; Somers and St. John, 1993), characteristics of alternative institutions are not included in the analyses since such characteristics were not collected as part of the BPS. To correct for this limitation, only those students who indicated they were attending their first-choice institution are included in the subsample.

Fourth, the findings are limited by the failure to examine the effects of financial aid and financial need upon application decisions. Some evidence (Spies, 1973; Manski and Wise, 1983; Spielvogel, 1992; Ozden, 1993) suggests that income and financial aid may have a greater effect upon the selection of institutions to which to apply than upon the choice of institution from among those accepted to attend. For instance, 1986 and 1988 high school seniors who were academically qualified for admission to the University of Michigan and who had family incomes below $30,000 were less likely than high school seniors who had higher family incomes to request that their ACT scores be sent to the University (an indication of intent to apply for admission). High school seniors with family incomes above $60,000 were more likely than high school seniors with lower incomes to actually apply for admission after controlling for background, information sources, and preference for various institutional characteristics (Spielvogel, 1992).

Other evidence suggests that the choice of institution to attend is a choice among institutions with similar characteristics (Spies, 1973; Tierney, 1980; Zemsky and Oedel, 1983; Annis and Rice,

1993). Students tend to self-select into institutions that enroll students with ability levels comparable to their own (Spies, 1973; Munday, 1976; Nolfi, et al., 1978; Fuller, et al., 1982; Manski and Wise, 1983; Seneca and Taussig, 1987). But, as Flint (1991) noted, the issue of "choice" is not whether financial aid encourages students to apply to more colleges, but whether financial aid enables students to consider attending a greater variety of institutions, including higher cost institutions. If students only consider institutions within a narrow range of prices, then financial aid can influence choice only within a relatively homogeneous set of institutions. But, if financial aid causes a student to consider a set of institutions with a wider range of prices by equalizing the net cost of various institutions, then the student may select an institution based upon characteristics other than cost, such as location or selectivity (Flint, 1993).

RESULTS

These results describe 1989/90 freshmen nationwide who met the following criteria: initially enrolled in a bachelor's degree program at a four-year college or university on a full-time basis, American citizen, dependent (as defined by financial aid eligibility criteria), and attended their first-choice institution.

Descriptive Statistics

This section examines the observed characteristics of freshmen who received financial aid without controlling for other explanations for the relationships. Characteristics of the following groups of students are compared: those who did and did not receive financial aid, those who received different packages of financial aid, those who received packages emphasizing different types of aid, and those who received packages emphasizing different sources of aid.

Characteristics of Students Who Received Financial Aid

Table 2 shows that more than one-half (59.0%) of 1989/90 freshmen received financial aid in 1989/90. While the percents of male and female freshmen who received financial aid were statistically equivalent (56.8% men and 60.8% women), the percent of freshmen who received financial aid varied by race group. Table 2 shows that about three-quarters of black (79.1%) and Hispanic (73.3%) freshmen received financial aid compared with about one-half of Asian American/Pacific Islander (47.8%) and white (57.2%) freshmen.

The percent of freshmen who received financial aid was inversely related to socioeconomic status (SES), mother's education, and father's education, suggesting that financial aid was awarded primarily based upon financial need. Table 2 shows that three-quarters (76.6%) of freshmen in the lowest SES quartile received financial aid, compared with less than two-thirds (61.8%) of freshmen in the second quartile, one-half (56.2%) of those in the third quartile, and only one-third (35.8%) of those in the highest quartile. Three-quarters (76.2%) of freshmen whose fathers had not graduated from high school received financial aid compared with about one-half of freshmen whose fathers had earned bachelor's degrees (52.2%) or advanced degrees (47.5%). The percent of students who received financial aid was not related to student SAT/ACT score, whether the student received remedial instruction (a proxy for academic preparation and ability), or the student's educational aspirations, further indicating that financial aid was awarded based upon financial need rather than academic ability or potential. Freshmen who received financial aid had higher average levels of academic self-confidence than freshmen who did not receive aid (7.03 versus 6.80, respectively), suggesting that students with greater academic self-confidence attended more expensive institutions and, consequently, were more likely to qualify for financial aid.

Major field was marginally related to whether the student received financial aid (p=.06). A higher percent of students who were majoring in occupational, liberal arts, or pre-professional fields received financial aid than of students who had not selected a major field. Table 2 shows that 64.0% of those with occupational majors, 60.8% of those with liberal arts majors, and 59.0% of those with pre-professional majors received financial aid, compared with only 53.6% of those who were undecided.

Table 2 also shows that institutional characteristics were related to receiving financial aid. A higher percent of students who attended private rather than public (74.3% versus 50.1%) and non-doctoral granting rather than doctoral granting (63.9% versus 53.6%) institutions received financial aid. Given that financial aid is awarded, in part, based upon costs of attendance, it is not surprising that average tuition and fees were 26.3% higher for freshmen who received financial aid ($4,998) than for freshmen who did not ($3,957).

Characteristics of Students Who Received Different Packages of Financial Aid

Table 3 shows that the most common package of financial aid received by 1989/90 freshmen was comprised of grants only. While about one-fifth of freshmen received only grants (20.3%), 16.5% received grants and loans, and 8.2% received grants, loans, and work study. About five percent received only loans (5.4%) or some other combination or type of aid (5.5%). Just 3.1% received a package of aid comprised of grants and work study.

Table 3 also shows that men and women were equally represented among recipients of different packages of financial aid. The package of financial aid received was related to students' race group, however. A higher proportion of Hispanic students (33.3%) than of white students (19.9%), black students (17.5%), and Asian American/Pacific Islander students (18.3%) received an aid package that consisted of only grants. A higher share of black freshmen (36.9%) than of white (15.2%), Hispanic

(19.6%), and Asian American/Pacific Islander (5.7%) freshmen received an aid package that consisted of grants and loans. A higher share of Asian American/Pacific Islander (7.8%) and white (5.5%) freshmen than of black (3.4%) and Hispanic (2.7%) freshmen received aid packages comprised of loans only.

Table 3 suggests that the combination of aid awarded was related to financial need. A higher share of students in the lowest SES quartile than of their counterparts in the highest SES quartile received grants and loans (27.7% versus 3.6%), grants, loans, and work-study (13.7% versus 2.0%), and grants and work-study (5.6% versus 1.0%). A larger proportion of students whose fathers had not graduated from high school than of students whose fathers had an advanced degree received grants, loans, and work study (13.8% versus 5.7%), grants and loans (22.9% versus 7.2%), and loans only (11.5% versus 5.6%).

The package of aid received was not related to whether the student received remedial instruction (a proxy for academic ability), educational aspirations, or major field (a proxy for expected future earnings). But, on average, students who received an aid package comprised of grants only (7.29), grants and work (7.43), or grants, loans, and work study (7.13) reported higher levels of academic self-confidence than recipients of loans only (6.45), grants and loans (6.82), other aid (6.86), or no aid (6.80). Similarly, students who received only grants (965.6) and grants, loans, and work study (957.2) had higher SAT/ACT scores, on average, than students who received no aid (948.8), loans only (918.7), grants and work study (911.0), or grants and loans (906.8).

The package of aid received was also associated with the characteristics of the institution attended. A higher share of students who attended private rather than public institutions received aid packages that included only grants (25.2% versus 17.5%), grants, loans, and work-study (15.4% versus 4.0%), and grants and loans (22.9% versus 12.8%). Similarly, a higher percent of students who attended non-doctoral granting rather than doctoral granting institutions received aid packages comprised of only grants (22.4% versus 18.1%), grants, loans, and work study (9.4% versus 6.8%), and grants and loans

(18.7% versus 14.1%). A higher percent of students who attended out-of-state rather than in-state institutions received aid packages comprised of grants, loans, and work study (13.5% versus 6.6%).

On average, tuition and fees were highest for students who received an aid package comprised of grants, loans, and work study, suggesting that students who attend the most expensive institutions must be willing to both borrow and work to fund the costs of their undergraduate education. Among recipients of grants, loans, and work study average tuition and fees were $7,466. On average, institutional tuition and fees were lower for students who received some other combination of aid ($3,686), no aid ($3,958), grants and work study ($4,294), and only loans ($4,213).

Characteristics of Students With Aid Packages That Emphasized Loans or Grants

Table 4 shows that one-third (33.6%) of 1989/90 freshmen received an aid package comprised predominantly of grants, 11.4% received an aid package comprised predominantly of loans, and 12.2% received an aid package in which neither grants nor loans represented more than one-half of the total aid awarded.

Table 4 also shows that the emphasis of the financial aid package was not related to the student's sex but was related to the student's race group. About one-half of Hispanic (53.0%) and black (48.0%) students received an aid package that emphasized grants, compared with one-third (31.8%) of white students and one-quarter (26.4%) of Asian American/Pacific Islander students.

The emphasis of the aid package on a particular type of aid was observed to be related to students' financial need. A higher share of students in the lowest SES quartile than of students in the highest quartile received aid packages comprised primarily of grants or primarily of loans. Nearly one-half (46.2%) of students in the lowest SES quartile received aid packages that emphasized grants compared with one-fifth (19.2%) of students in the highest SES quartile. About 15% of students in the

lower two SES quartiles but only 4.8% of students in the highest SES quartile received aid packages that emphasized loans. Among students whose fathers had not graduated from high school, 43.1% received aid packages that emphasized grants and 19.0% received aid packages that emphasized loans. By comparison, among students whose fathers had earned advanced degrees, 28.7% received aid packages that emphasized grants and 8.4% received aid packages that emphasized loans.

The emphasis of the aid package on grants or loans was not related to the student's SAT score, whether the student received remedial instruction (a proxy for academic preparation), major field (a proxy for expected future earnings), or educational aspirations. Academic confidence levels were higher, on average, for students who received aid packages that emphasized grants than for students who received aid packages that emphasized loans (7.21 versus 6.63).

Higher percents of students who attended private (47.2%), non-doctoral granting (38.0%) institutions received aid packages that emphasized grants than students who attended public (25.7%), doctoral granting (28.8%) institutions. The location of the institution (i.e., in-state or out-of-state) was unrelated to whether the aid package emphasized grants or loans. Average tuition and fees were higher for students who received aid packages that emphasized grants ($5,351) than for students who received aid packages that emphasized loans ($4,340) and for students who did not receive financial aid ($3,993).

Characteristics of Students With Aid Packages Emphasizing Particular Source of Aid

Table 5 shows that one-quarter (25.7%) of all 1989/90 freshmen received aid packages that were comprised primarily of Title IV federal financial aid (e.g., Pell Grants, Federal Family Education Loans). About 14.7% of freshmen received aid packages that were funded primarily by the institution and just 5.6% of freshmen received aid packages in which more than one-half was funded by a state government.

Table 5 also shows that the emphasis of the financial aid package on a particular source of aid was not related to the student's sex but was related to the student's race group. Higher percents of black (55.9%) and Hispanic (37.0%) students than white (23.4%) and Asian American/Pacific Islander (14.3%) students received aid packages comprised primarily of Title IV aid. Hispanic students were relatively over-represented among recipients of aid packages that emphasized state government sources of aid, since 10.1% of Hispanic students but 5.6% of all students received aid packages comprised primarily of state aid.

The percent of students who received aid packages comprised primarily of Title IV aid decreased as socioeconomic status increased. For example, nearly one-half (44.5%) of students in the lowest SES quartile received an aid package that emphasized Title IV sources of aid, compared with just 7.0% of students in the highest SES quartile. One-half (50.7%) of students whose fathers had not graduated from high school received an aid package that emphasized Title IV aid, compared with just 13.5% of students whose fathers had an advanced degree. A smaller percent of students in the lowest SES quartile than of students in the second, third, and highest SES quartiles received aid packages comprised primarily of institutional sources of aid (9.7% versus 13.2%, 19.6%, and 16.8%, respectively). About one-fifth (20.3%) of students whose fathers had advanced degrees received aid packages that emphasized institutional sources of aid, compared with only 5.1% of students whose fathers had not graduated from high school.

The emphasis of the aid package on a particular source of aid was not related to whether a student received remedial instruction (a proxy for academic preparation) but was related to the student's SAT score, academic self-confidence, and educational aspirations. On average, students who received aid packages that emphasized institutional aid (1010.3) had higher SAT/ACT equivalent scores than students who received aid packages that emphasized no source of aid (966.4), state sources (903.9), or

Title IV sources (888.8), or who received no financial aid (949.1). Average levels of academic self-confidence were higher among students who received aid packages comprised primarily of institutional aid (7.48) than among students who received aid packages comprised primarily of Title IV aid (6.72) or state aid (6.82). Similarly, a higher percent of freshmen who aspired to earn an advanced degree than of freshmen who aspired to no more than a bachelor's degree received an aid package that emphasized institutional aid (16.6% versus 11.4%). A smaller percent of freshmen who aspired to an advanced degree than of freshmen who aspired to no more than a bachelor's degree received an aid package that emphasized Title IV aid (23.0% versus 30.4%).

A higher proportion of students who attended private (27.1%), non-doctoral granting (16.5%), out-of-state (23.6%), and higher price four-year institutions than of students who attended public (7.6%), doctoral granting (12.8%), in-state (12.1%), and lower price four-year institutions received an aid package funded primarily from institutional sources. Average tuition and fees ranged from a high of $6,921 for students who received an aid package that emphasized institutional sources of aid to a low of $3,784 for students who received an aid package that emphasized state sources of aid.

Characteristics of Students Who Attended Higher Cost Institutions

Table 6 shows that average tuition and fees were $4,570 among 1989/90 dependent, first-time freshmen who were enrolled full-time at their first-choice four-year college or university. On average, men and women attended institutions with statistically equivalent tuition and fees ($4,782 for men versus $4,392 for women). Asian American/Pacific Islander ($6,857) and white ($4,657) students attended higher price institutions than Hispanic ($3,363) and black ($3,276) students.

Institutional tuition and fees were observed to increase with socioeconomic status quartile and parents' education. Average tuition and fees ranged from $3,585 for students in the lowest SES quartile

to $6,281 for students in the highest SES quartile. Students whose fathers had not graduated from high school attended institutions with average tuition and fees of $3,684, while students whose fathers had advanced degrees attended institutions with average tuition and fees of $6,404.

Students with higher academic abilities and educational aspirations attended higher price institutions. Average tuition and fees ranged from a low of $3,071 for students with SAT/ACT scores in the lowest quartile to a high of $6,424 for students with SAT/ACT scores in the highest quartile. Students who participated in remedial instruction attended lower price institutions, on average, than students who did not participate ($3,680 versus $4,697). Tuition and fees were highest for students with the greatest confidence in their own academic abilities, since average tuition and fees ranged from $3,622 for students in the lowest quartile of academic self-confidence to $5,810 for students in the highest quartile. Average tuition and fees were higher for students who aspired to an advanced degree than for students who aspired to no more than a bachelor's degree ($5,102 versus $3,722). Tuition and fees were higher, on average, among those who were undecided regarding their college major and lowest among those with occupational majors ($5,394 versus $3,871), suggesting that expected future earnings may be related to institutional choice.

Average tuition and fees were higher for students who attended private rather than public institutions ($8,578 versus $2,247) and out-of-state rather than in-state institutions ($8,441 versus $3,425). Tuition and fees did not differ statistically for students who attended non-doctoral granting and students who attended doctoral granting institutions ($4,585 versus $4,554).

Table 2. Characteristics of Students Who Did and Did Not Receive Financial Aid

Variable	No Aid	Received Any Aid	Statistical Difference
Adjusted Weighted Sample Size	41.0% n = 490	59.0% n = 704	
Sex			χ^2= 1.93, df = 1, p = .16
Female	39.2%	60.8%	n = 650
Male	43.2%	56.8%	n = 544
Race			χ^2= 19.5, df = 3, p < .001
Asian American	52.2%	47.8%	n = 30
Black	20.9%	79.1%	n = 74
Hispanic	26.7%	73.3%	n = 50
White	42.8%	57.2%	n = 1,040
SES Quartile			χ^2= 106.0, df = 3, p < .001
Lowest	23.4%	76.6%	n = 357
Second	38.2%	61.8%	n = 245
Third	43.8%	56.2%	n = 329
Highest	64.2%	35.8%	n = 263
Father's Education			χ^2= 29.6, df = 4, p < .001
Less than H. S.	23.8%	76.2%	n = 69
H. S. Graduate	35.9%	64.1%	n = 365
Some Postsec. Ed.	39.7%	60.3%	n = 221
Bachelor's Degree	47.8%	52.2%	n = 260
Advanced Degree	52.5%	47.5%	n = 230
Mother's Education			χ^2= 20.2, df = 4, p < .001
Less than H. S.	18.2%	81.8%	n = 44
H. S. Graduate	38.5%	61.5%	n = 488
Some Postsec. Ed.	40.0%	60.0%	n = 300
Bachelor's Degree	50.3%	49.7%	n = 223
Advanced Degree	46.3%	53.7%	n = 118

Table 2. Characteristics of Students Who Did and Did Not Receive Financial Aid (Continued)

Variable	No Aid	Received Any Aid	Statistical Difference
Adjusted Weighted Sample Size	41.0% n = 490	59.0% n = 704	
Remedial Instruction			χ^2= 1.68, df = 1, p = .19
No	40.3%	59.7%	n = 1,045
Yes	45.9%	54.1%	n = 149
Student SAT/ACT Score	948.8 sd = 157.4	937.7 sd = 175.6	F = 1.26, df = 1, 1200, p=.26
Academic Self-Confidence	6.80 sd = 1.68	7.03 sd = 1.62	F = 5.34, df = 1, 1189, p < .05
Ed. Aspirations			χ^2= .14, df = 1, p = .70
Bachelor's Degree	40.1%	59.9%	n = 427
Advanced Degree	41.3%	58.7%	n = 740
Major			χ^2= 7.36, df = 3, p = .06
Liberal Arts	39.2%	60.8%	n = 293
Pre-Professional	41.0%	59.0%	n = 282
Occupational	36.0%	64.0%	n = 264
Undecided	46.4%	53.6%	n = 354
Institutional Control			χ^2= 66.9, df = 1, p < .001
Private	25.7%	74.3%	n = 438
Public	49.9%	50.1%	n = 756
Institutional Type			χ^2= 12.9, df = 1, p < .001
Non-Doctoral	36.1%	63.9%	n = 620
Doctoral Granting	46.4%	53.6%	n = 574
Legal Residence			χ^2= .62, df = 1, p = .43
Different State	43.1%	56.9%	n = 271
Same State	40.4%	59.6%	n = 922
Tuition and Fees 89	3,957 sd = 4,209	4,998 sd = 4,063	F= 18.4, df = 1, 1190, p<.001

Table 3. Characteristics of Students Receiving Different Packages of Aid

Variable	No Aid	Grants only	Grants & Work	Grants, Loans, Work	Grants & Loans	Loans only	Other only	Statistical Difference
Adjusted Weighted Sample Size	41.0% n = 490	20.3% n = 242	3.1% n = 38	8.2% n = 97	16.5% n = 197	5.4% n = 64	5.5% n = 66	
Sex								χ^2= 10.1, df = 6, p=.12
Female	39.2%	22.5%	3.8%	8.5%	14.7%	5.2%	6.0%	n = 650
Male	43.2%	17.7%	2.4%	7.7%	18.6%	5.5%	4.9%	n = 544
Race								χ^2=53.6, df=18, p<.001
Asian American	52.2%	18.3%	1.5%	5.6%	5.7%	7.8%	8.7%	n = 30
Black	26.5%	17.5%	9.2%	8.0%	36.9%	3.4%	4.1%	n = 74
Hispanic	26.7%	33.1%	7.3%	7.3%	19.6%	2.7%	3.4%	n = 50
White	24.8%	19.9%	2.6%	8.3%	15.2%	5.5%	5.6%	n = 1,040
SES Quartile								χ^2 =171, df=18, p<.001
Lowest	23.4%	20.6%	5.6%	13.6%	27.7%	5.5%	3.6%	n = 357
Second	38.2%	19.3%	2.8%	9.0%	20.3%	6.3%	4.1%	n = 245
Third	43.8%	23.5%	2.5%	6.5%	11.9%	4.8%	7.0%	n = 329
Highest	64.2%	16.8%	1.0%	2.0%	3.6%	4.9%	7.6%	n = 263
Father's Education								χ^2=60.2, df=24, p<.001
Less than H. S.	23.8%	21.1%	5.5%	13.8%	22.9%	11.5%	1.3%	n = 69
H. S. Graduate	35.9%	19.7%	3.9%	9.2%	20.3%	6.1%	4.8%	n = 365
Some Postsec.	39.7%	20.9%	2.2%	8.2%	20.4%	2.9%	5.6%	n = 221
Bachelor's	47.8%	18.8%	2.3%	7.4%	12.3%	4.7%	6.7%	n = 260
Advanced Degree	52.5%	21.1%	2.0%	5.7%	7.2%	5.6%	5.9%	n = 230
Mother's Education								χ^2=53.6, df 24, p<.001
Less than H. S.	18.2%	28.2%	14.3%	9.2%	23.5%	4.4%	2.2%	n = 44
H. S. Graduate	38.5%	18.2%	2.2%	8.7%	19.4%	6.7%	6.4%	n = 488
Some Postsec.	40.0%	20.3%	3.9%	9.6%	16.5%	4.5%	5.2%	n = 300
Bachelor's	50.3%	20.9%	2.8%	5.4%	11.0%	3.9%	5.7%	n = 223
Advanced Degree	46.3%	24.2%	2.0%	8.1%	10.7%	4.3%	4.4%	n = 118

Table 3. Characteristics of Students Receiving Different Packages of Aid (Continued)

Variable	No Aid	Grants only	Grants & Work	Grants, Loans, Work	Grants & Loans	Loans only	Other only	Statistical Difference
Adjusted Sample	n = 490	n = 242	n = 38	n = 97	n = 197	n = 64	n = 66	
Remedial Instruction								χ^2= 9.34, df =6, p=.16
No	40.3%	21.2%	2.8%	8.4%	16.6%	5.2%	5.4%	n = 1,045
Yes	45.9%	13.8%	5.8%	6.2%	16.1%	6.2%	6.0%	n = 149
Student SAT/ACT	948.8 sd=157	965.6 sd=181	911.0 sd=194	957.2 sd=189	906.8 sd=163	918.7 sd=158	931.2 sd=163	F = 3.01, df = 6, 1195, p < .01
Academic Self-Confidence	6.80 sd=1.70	7.29 sd = 1.6	7.43 sd = 1.6	7.13 sd=1.60	6.82 sd=1.57	6.45 sd=1.64	6.86 sd=1.62	F = 4.30, df = 6, 1184, p < .001
Ed. Aspirations								χ^2=7.8, df = 6, p=.25
Bachelor's	40.1%	18.6%	2.8%	6.9%	19.1%	6.4%	6.1%	n = 410
Advanced Degree	41.3%	21.4%	3.5%	9.0%	14.9%	4.9%	4.9%	n = 746
Major								χ^2=21, df = 18, p =.29
Liberal Arts	39.2%	22.8%	3.4%	8.3%	16.6%	4.6%	5.1%	n = 254
Pre-Professional	41.0%	20.4%	2.4%	7.2%	17.6%	5.5%	6.1%	n = 264
Occupational	36.0%	19.9%	5.3%	7.1%	19.2%	7.5%	5.0%	n = 282
Undecided	46.4%	18.4%	2.0%	9.7%	13.6%	4.3%	5.7%	n = 354
Institution Control								χ^2 =120, df=6, p<.001
Private	25.7%	25.2%	3.9%	15.4%	22.9%	3.3%	3.6%	n = 438
Public	49.9%	17.5%	2.7%	4.0%	12.8%	6.5%	6.6%	n = 756
Institution Type								χ^2= 18.5, df =6, p<.01
Non-Ph.D.	36.1%	22.4%	3.4%	9.4%	18.7%	5.3%	4.7%	n = 620
Ph.D. Granting	46.4%	18.1%	2.9%	6.8%	14.1%	5.4%	6.4%	n = 574
Legal Residence								χ^2= 19.3, df =6, p<.01
Different State	43.1%	17.9%	1.8%	13.5%	13.7%	6.2%	3.9%	n = 271
Same State	40.4%	21.0%	3.6%	6.6%	17.3%	5.1%	5.9%	n = 922
Tuition and Fees	3,958 sd=4209	4,542 sd=3688	4,294 sd=3659	7,466 sd=4730	5,155 sd=3939	4,213 sd=3489	3,686 sd=4032	F= 11.5, df = 6,1185, p < .001

Table 4. Emphasis of Aid Package on Particular Type of Aid

Variable	No Aid	No Type Dominant	Grants	Loans	Statistical Difference
Adjusted Weighted Sample Size	42.8% n = 513	12.2% n = 146	33.6% n = 401	11.4% n = 136	
Sex					χ^2= 2.36, df =3,p =.50
Female	40.9%	12.5%	35.0%	11.5%	n = 650
Male	45.2%	11.8%	31.8%	11.3%	n = 544
Race					χ^2=21.1, df =9,p <.05
Asian American	53.0%	12.8%	26.4%	7.8%	n = 30
Black	26.9%	12.3%	48.0%	12.8%	n = 74
Hispanic	26.7%	10.7%	53.0%	9.6%	n = 50
White	44.5%	12.2%	31.8%	11.5%	n = 1,040
SES Quartile					χ^2=106, df = 9, p<.001
Lowest	26.0%	12.7%	46.2%	15.1%	n = 357
Second	40.5%	11.1%	34.1%	14.3%	n = 245
Third	45.0%	13.5%	31.0%	10.5%	n = 329
Highest	65.1%	10.9%	19.2%	4.8%	n = 263
Father's Education					χ^2=30.4, df =12, p<.01
Less than H. S.	25.0%	12.9%	43.1%	19.0%	n = 69
H. S. Graduate	38.1%	12.9%	36.5%	12.5%	n = 365
Some Postsec. Ed.	40.9%	12.0%	35.1%	11.9%	n = 221
Bachelor's Degree	49.4%	13.1%	27.2%	10.3%	n = 260
Advanced Degree	53.1%	9.8%	28.7%	8.4%	n = 230
Mother's Education					χ^2 = 24.7, df =12, p <.05
Less than H. S.	18.2%	17.2%	51.4%	13.3%	n = 44
H. S. Graduate	40.1%	13.6%	33.4%	12.9%	n = 488
Some Postsec. Ed.	42.6%	12.9%	32.9%	11.6%	n = 300
Bachelor's Degree	52.4%	8.9%	30.2%	8.5%	n = 223
Advanced Degree	46.9%	10.8%	33.8%	8.5%	n = 118

Table 4. Emphasis of Aid Package on Particular Type of Aid (Continued)

Variable	No Aid	No Type Dominant	Grants	Loans	Statistical Difference
Adjusted Weighted Sample Size	42.8% n = 513	12.2% n = 146	33.6% n = 401	11.4% n = 136	
Remedial Instruction					χ^2= 4.24, df = 3, p=.24
No	41.9%	12.0%	34.5%	11.5%	n = 1,045
Yes	49.3%	13.2%	26.8%	10.7%	n = 149
Student SAT/ACT Score	947.4 sd =158.8	938.1 sd =172.9	947.1 sd =180.9	912.7 sd =158.4	F = 1.70, df = 3, 1198 p = .17
Academic Self- Confidence	6.80 sd = 1.67	6.95 sd = 1.62	7.21 sd = 1.60	6.63 sd = 1.64	F = 6.40, df = 3, 1187 p < .001
Ed. Aspirations					χ^2= 6.63, df = 3, p=.08
Bachelor's Degree	42.4%	13.4%	30.2%	14.0%	n = 427
Advanced Degree	42.9%	11.3%	35.6%	10.2%	n = 740
Major					χ^2= 9.9, df =9, p =.36
Liberal Arts	40.5%	12.4%	37.2%	9.9%	n = 293
Pre-Professional	43.6%	12.0%	32.5%	11.8%	n = 282
Occupational	38.1%	14.0%	33.5%	14.4%	n = 264
Undecided	47.7%	10.8%	31.4%	10.1%	n = 354
Institution Control					χ^2= 78.5, df =3,p<.001
Private	27.6%	14.3%	47.2%	10.9%	n = 438
Public	51.7%	10.9%	25.7%	11.7%	n = 756
Institution Type					χ^2= 15.8 df = 3, p <.01
Non-Doctoral	37.8%	12.2%	38.0%	12.0%	n = 620
Doctoral Granting	48.3%	12.2%	28.8%	10.7%	n = 574
Legal Residence					χ^2= 2.70, df =3, p =.44
Different State	45.5%	10.4%	31.2%	12.9%	n = 271
Same State	42.1%	12.7%	34.3%	11.0%	n = 922
Tuition and Fees 1989	3,993 sd = 4206	4,665 sd = 3967	5,351 sd = 4219	4,340 sd = 3588	F = 8.32, df = 3, 1188 p<.001

Table 5. Emphasis of Aid Package on Particular Source of Aid

Variable	No Aid	No Source Dominant	Title IV	State	Institution	Statistical Difference
Adjusted Weighted Sample Size	41.5% n = 496	12.4% n = 148	25.7% n = 307	5.6% n = 67	14.7% n = 176	
Sex						
						χ^2= 3.49, df = 4, p=.48
Female	39.6%	13.0%	27.3%	5.2%	14.9%	n = 650
Male	43.8%	11.6%	23.9%	6.1%	14.5%	n = 544
Race						
						χ^2=50.6, df =12, p<.001
Asian American	53.1%	12.2%	14.3%	8.7%	11.7%	n = 30
Black	22.9%	7.7%	55.9%	1.0%	12.5%	n = 74
Hispanic	26.7%	15.1%	37.0%	10.1%	11.1%	n = 50
White	43.2%	12.6%	23.4%	5.7%	15.1%	n = 1,040
SES Quartile						
						χ^2 = 181, df = 12, p<.001
Lowest	24.2%	14.8%	44.5%	6.8%	9.7%	n = 357
Second	38.5%	11.2%	30.5%	6.5%	13.2%	n = 245
Third	43.9%	14.1%	16.8%	5.6%	19.6%	n = 329
Highest	64.9%	8.1%	7.0%	3.2%	16.8%	n = 263
Father's Education						
						χ^2=81.2, df = 16, p<.001
Less than H. S.	24.5%	--	50.7%	10.8%	5.1%	n = 69
H. S. Graduate	36.5%	13.5%	30.2%	6.8%	13.0%	n = 365
Some Postsec. Ed.	39.8%	15.5%	28.1%	3.9%	12.7%	n = 221
Bachelor's Degree	48.4%	12.1%	17.5%	4.7%	17.3%	n = 260
Advanced Degree	52.8%	9.4%	13.5%	4.0%	20.3%	n = 230
Mother's Education						
						χ^2= 62.0, df = 16, p<.001
Less than H. S.	18.2%	23.3%	39.8%	14.2%	--	n = 44
H. S. Graduate	38.6%	12.2%	30.5%	6.3%	12.4%	n = 488
Some Postsec. Ed.	41.1%	13.0%	28.2%	4.0%	13.6%	n = 300
Bachelor's Degree	50.5%	11.6%	13.9%	3.9%	20.0%	n = 223
Advanced Degree	46.5%	10.1%	17.1%	5.4%	20.8%	n = 118

Table 5. Emphasis of Aid Package on Particular Source of Aid (Continued)

Variable	No Aid	No Source Dominant	Title IV	State	Institution	Statistical Difference
Adjusted Weighted Sample Size	41.5% n = 496	12.4% n = 148	25.7% n = 307	5.6% n = 67	14.7% n = 176	
Remedial Instruct.						χ^2= 6.36, df = 4, p=.17
No	40.9%	13.1%	25.2%	5.6%	15.2%	n = 1,045
Yes	45.9%	7.7%	29.5%	5.9%	11.1%	n = 149
Student SAT/ACT Score	949.1 sd =157.5	966.4 sd =180.0	888.8 sd = 157.6	903.9 sd = 170.2	1010.3 sd = 175.0	F = 17.8, df = 4, 1197 p < .001
Academic Self-Confidence	6.79 sd = 1.68	7.24 sd = 1.66	6.72 sd = 1.53	6.82 sd = 1.65	7.48 sd = 1.62	F = 8.64, df = 4, 1186 p < .001
Ed. Aspirations						χ^2= 14.5, df = 4, p<.01
Bachelor's Degree	40.5%	10.6%	30.4%	7.0%	11.4%	n = 427
Advanced Degree	41.8%	13.5%	23.0%	5.0%	16.6%	n = 740
Major						χ^2=23.1, df = 12,p<.05
Liberal Arts	39.4%	12.8%	23.9%	7.1%	16.8%	n = 293
Pre-Professional	41.8%	12.9%	24.0%	6.8%	14.4%	n = 282
Occupational	36.1%	13.8%	34.2%	4.6%	11.2%	n = 264
Undecided	47.1%	10.6%	22.3%	4.2%	15.8%	n = 354
Institution Control						χ^2=116.3, df =4 , p<.001
Private	26.6%	16.0%	24.9%	5.4%	27.1%	n = 438
Public	40.2%	10.3%	26.2%	5.7%	7.6%	n = 756
Institution Type						χ^2= 20.1, df = 4, p<.001
Non-Doctoral	36.5%	12.1%	27.3%	7.5%	16.5%	n = 620
Doctoral Granting	46.9%	12.7%	24.0%	3.6%	12.8%	n = 574
Legal Residence						χ^2= 40.0, df = 4, p<.001
Different State	44.3%	8.7%	22.7%	0.8%	23.6%	n = 272
Same State	40.4%	13.8%	26.7%	7.0%	12.1%	n = 930
Tuition and Fees 1989	4,000 sd = 4229	5,209 sd = 4242	4,006 sd = 3479	3,784 sd = 2835	6,921 sd = 4483	F = 20.6, df = 4, 1187 p < .001

Table 6. Average Institutional Tuition and Fees by Student Characteristics

Variable	Mean	Standard Deviation	Statistical Significance
All Students	4,570	4,154	n = 1,192
Sex			F = 2.60, df = 1, 1190, p = .11
Female	4,392	4,075	n = 648
Male	4,782	4,240	n = 543
Race Group			F = 6.93, df = 3, 1188, p <.001
Asian American	6,857	5,950	n = 28
Black	3,276	3,280	n = 73
Hispanic	3,363	4,122	n = 50
White	4,657	4,117	n = 1,039
SES Quartile			F = 23.9, df = 3, 1188, p <.001
Lowest	3,585	3,288	n = 355
Second	4,105	3,497	n = 244
Third	4,611	4,258	n = 328
Highest	6,281	5,028	n = 263
Father's Education			F = 15.4, df = 4, 1140, p <.001
Less than H. S.	3,684	3,341	n = 68
H. S. Graduate	4,038	3,539	n = 364
Some Postsecondary	3,936	3,649	n = 221
Bachelor's Degree	4,641	4,305	n = 259
Advanced Degree	6,404	5,076	n = 230
Mother's Education			F = 14.6, df = 4, 1167, p <.001
Less than H. S.	3,555	3,294	n = 44
H. S. Graduate	3,912	3,521	n = 488
Some Postsecondary	4,317	3,924	n = 297
Bachelor's Degree	5,543	4,868	n = 223
Advanced Degree	6,587	5,075	n = 118
Remedial Instruction			F = 7.87, df = 1, 1190, p < .01
No	4,697	4,229	n = 1,043
Yes	3,680	3,466	n = 149

Table 6. Average Institutional Tuition and Fees by Student Characteristics(Continued)

Variable	Mean	Standard Deviation	Statistical Significance
Student SAT/ACT			F = 39.0, df = 3, 1992, p < .001
Lowest Quartile	3,071	2,778	n = 304
Second Quartile	3,904	3,353	n = 320
Third Quartile	5,060	4,371	n = 302
Highest Quartile	6,424	5,119	n = 274
Academic Self-			F = 15.0, df = 3, 1185, p <.001
Lowest Quartile	3,622	3,273	n = 255
Second Quartile	4,139	3,671	n = 340
Third Quartile	4,636	4,177	n = 297
Fourth Quartile	5,810	4,964	n = 295
Ed. Aspirations			F = 30.5, df = 2, 1164, p <.001
Bachelor's Degree	3,722	3,239	n = 427
Advanced Degree	5,102	4,539	n = 738
Major Field			F = 7.67, df = 3, 1188, p<.001
Liberal Arts	4,329	3,984	n = 292
Pre-Professional	4,442	3,681	n = 282
Occupational	3,871	3,344	n = 264
Undecided	5,394	4,994	n = 353
Institution Control			F = 1399, df =1, 1190, p<.001
Private	8,578	4,077	n = 437
Public	2,247	1,705	n = 754
Institution Type			F = .02, df = 1, 1190, p = .90
4-Year Non-Ph.D.	4,585	3,742	n = 620
4 -Year Ph.D.	4,554	4,562	n = 571
Legal Residence			F = 410.4, df =1, 1189, p < .001
Different State	8,441	4,539	n = 270
Same State	3,425	3,247	n = 920

Multivariate Analyses

The purpose of this section is to examine the effects of financial aid upon tuition and fees at the institution attended while controlling for other explanations for the observed relationships. Tables 7 and 8 show the statistically significant predictors of tuition and fees after non-significant predictors were eliminated from the regression models. Sex, parents' education, educational aspirations, major field, and institutional type (doctoral or non-doctoral granting) were not related to tuition and fees after controlling for the other variables in the model and, therefore, were dropped from the analyses. Interactions between socioeconomic status quartile and financial aid were also not statistically significant, suggesting that the effects of financial aid upon the price of institution attended did not vary by socioeconomic status.

Table 7 shows that, regardless of the way in which financial aid was measured, the regression model accounted for approximately two-thirds (63.2% to 64.2%) of the variance in institutional tuition and fees. Table 7 also shows that the most important predictors of the tuition and fees at the institution attended were: institutional control (public or private), whether the institution was in the same state as the student's legal residence, and the student's SAT/ACT equivalent score. On average, after controlling for race, socioeconomic status quartile, major field, and financial aid, 1989/90 freshmen who chose private, out-of-state institutions and who had higher SAT/ACT scores attended higher price institutions than freshmen who attended public, in-state institutions and who had lower SAT/ACT scores.

Table 7. Standardized Regression Coefficients for Predictors of LN(Tuition and Fees) Reduced Models (One model for each financial aid specification)

Independent Variable	(Model 1) Received Aid	(Model 2) Aid / Cost Ratio	(Model 3) Aid Package	(Model 4) Type of Aid	(Model 5) Dominant Type	(Model 6) Source Aid	(Model 7) Dominant Source
Received Any Aid	0.071***						
Aidratio: 25% or Less		0.039*					
Aidratio: 25.01% to 50%		0.077***					
Aidratio: 50.1% to 75%		0.074***					
Aidratio: More than 75%		0.026					
Loans Only			0.082***				
Grants, Loans, & Work			0.079***				
Grants & Loans			0.078***				
Received Loan				0.112***			
Predomin. Grants					0.055*		
Predomin. Loans					0.064***		
Received Title IV Aid						0.053**	
Received State Aid						0.084***	
Predomin. Title IV							0.046*
Predomin. State Aid							0.048**
Predomin. Institution							0.057***
No Source Dominant							0.047*
Black			0.007		0.015		
Hispanic	-0.095***	-0.095***	-0.090***	-0.109***	-0.095***	-0.096***	-0.095***
Lowest SES Quartile	-0.072***	-0.070**	-0.085***	-0.090***	-0.068**	-0.094***	-0.066**
Second SES Quartile	-0.061**	-0.063**	-0.071***	-0.072***	-0.060**	-0.072***	-0.058**
Third SES Quartile	-0.041	-0.042	-0.043	-0.044	-0.039	-0.044	-0.040
SAT Score / 100	0.107***	0.108***	0.106***	0.111***	0.107***	0.106***	0.105***
Acad. Self-Confidence	0.032	0.032	0.042*	0.037	0.033	0.032	0.031
Public Institution	-0.616***	-0.611***	-0.615***	-0.610***	-0.624***	-0.604***	-0.614***
In-State Institution	-0.208***	-0.210***	-0.200***	-0.199***	-0.205***	-0.227***	-0.211***
Loans Only x Black			-0.048**				
Rec. Loan x Hispanic				0.037			
Predomin. Loan x Black					-0.041*		
Adjusted R Square	0.633	0.635	0.643	0.642	0.639	0.639	0.632

***p < .001, **p < .01, *p < .05

Note: Only statistically significant variables (p < .05) were included in the final regression models.

Table 8. Unstandardized Regression Coefficients for Predictors of LN(Tuition and Fees) Reduced Models (One model for each financial aid specification)

Variable	(Model 1) Received Aid	(Model 2) Aid / Cost Ratio	(Model 3) Aid Package	(Model 4) Type of Aid	(Model 5) Dominant Type	(Model 6) Source Aid	(Model 7) Dominant Source
Received Any Aid	0.131***						
Aidratio: 25% or Less		0.107*					
Aidratio: 25.01% to 50%		0.203***					
Aidratio: 50.1% to 75%		0.198***					
Aidratio: More than 75%		0.062					
Loans Only			0.332***				
Grants, Loans, & Work			0.265***				
Grants & Loans			0.193***				
Received Loan				0.221***			
Predomin. Grants					0.106**		
Predomin. Loans					0.184***		
Received Title IV Aid						0.099**	
Received State Aid						0.171***	
Predomin. Title IV							0.096*
Predomin. State Aid							0.192**
Predomin. Institution							0.146***
No Source Dominant							0.130*
Black			0.027		0.057		
Hispanic	-0.433***	-0.437***	-0.410***	-0.501***	-0.433***	-0.439***	-0.434***
Lowest SES Quartile	-0.143***	-0.140**	-0.169***	-0.179***	-0.135**	-0.188***	-0.131**
Second SES Quartile	-0.138**	-0.141**	-0.160***	-0.162***	-0.136**	-0.164***	-0.131**
Third SES Quartile	-0.084	-0.086	-0.089	-0.091	-0.079	-0.091	-0.083
SAT Score / 100	0.058***	0.059***	0.057***	0.060***	0.058***	0.057***	0.057***
Acad. Self-Confidence	0.018	0.018	0.023*	0.021	0.018	0.018	0.017
Public Institution	-1.169***	-1.160***	-1.166***	-1.158***	-1.184***	-1.146***	-1.166***
In-State Institution	-0.455***	-0.458***	-0.436***	-0.435***	-0.448***	-0.497***	-0.462***
Loans Only x Black			-0.962**				
Rec. Loan x Hispanic				0.310			
Predomin. Loan x Black					-0.428*		
Constant	8.485***	8.474***	8.456***	8.448***	8.502***	8.519***	8.499***
Adjusted R Square	0.633	0.635	0.643	0.642	0.639	0.639	0.632

***p < .001, **p < .01, *p < .05

Note: Only statistically significant variables (p < .05) were included in the final regression models.

Effects of Financial Aid upon Tuition and Fees at the Institution Attended

Even after controlling for race, socioeconomic status, academic ability, and institutional characteristics, students who received financial aid attended higher price institutions. A comparison of the standardized regression coefficients shown in Table 7 shows that receiving financial aid was the sixth most important predictor of price of institution attended. Financial aid was less important than institutional control (public or private), institution location (in-state or out-of-state), student SAT/ACT score, race, and socioeconomic status. But, Column 1 of Table 8 shows that, even after controlling for institutional characteristics, SAT/ACT score, and socioeconomic status, the price of the four-year college or university attended by 1989/90 freshmen who received financial aid was 13.1% higher, on average, than the price of the institution attended by freshmen who did not receive aid.

Column 2 of Table 9 shows that the effect upon tuition and fees of the amount of aid received relative to the costs of attendance was not linear. On average, students who received financial aid covering 26% to 75% of total costs attended institutions that charged about 20% higher tuition and fees than students who did not receive financial aid or who received financial aid covering more than 75% of total costs. Students who received financial aid covering 25% or less of total costs attended institutions that charged 10.7% higher tuition and fees than students who did not receive aid or who received financial aid covering more than 75% of the costs of attendance. After controlling for socioeconomic status, race, SAT score, and institutional characteristics, students whose aid package covered more than three-quarters of total costs and students who received no financial aid attended institutions with comparable tuition and fees, on average.

Column 3 of Table 9 shows that financial aid packages comprised of only loans, grants, loans, and work study, and grants and loans were more effective than other packages of financial aid, including

packages comprised of only grants, grants and work study, or other aid in enabling 1989/90 full-time, dependent freshmen to attend higher price institutions. On average, freshmen who received no financial aid and freshmen who received aid packages comprised of only grants, grants and work study, or other aid attended institutions with comparable prices. Freshmen who received aid packages that included only loans attended institutions that charged 33.2% higher tuition and fees, on average, than freshmen who received no financial aid. Relative to freshmen who received no financial aid, students who received aid packages comprised of grants, loans, and work study attended institutions with 26.5% higher tuition and fees while students who received aid packages comprised of grants and loans attended institutions with 19.3% higher tuition and fees.

Column 4 shows that 1989/90 freshmen who received loans attended institutions with 22.1% higher tuition and fees, on average, than freshmen who received grants or who received no financial aid. Moreover, Column 5 shows that students who received an aid package comprised primarily of loans attended institutions with 18.4% higher tuition and fees than students who received no financial aid. Simply receiving grants did not influence the price of institution attended, since receiving grants was not a statistically significant predictor of tuition and fees in Model 4. But, the amount of grants received was important, since students who received aid packages that emphasized grants attended institutions with 10.6% higher tuition and fees, on average, than students who received no financial aid (Column 5).

Columns 6 and 7 show that receiving financial aid from federal Title IV programs and from state government sources enabled students to attend higher price institutions regardless of the amount of aid that was received from these sources. Column 6 shows that students who received any amount of Title IV aid attended 9.9% higher price institutions and students who received any amount of state aid attended 17.1% higher price institutions than students who received no financial aid. Similarly, Column 7 shows that students who received the majority of their aid from Title IV programs attended institutions with

9.6% higher prices and students who received the majority of their aid from state governments attended institutions with 19.2% higher prices than students who received no financial aid. Institutional aid appeared to influence the price of institution attended only if institutional aid comprised more than one-half of the aid package. Simply receiving institutional aid was not a statistically significant predictor of price in Model 6. But, Column 7 shows that students who received the majority of their aid from institutional sources attended institutions with 14.6% higher prices. Receiving an aid package in which no source dominated was also more effective than receiving no financial aid in enabling students to attend higher price institutions, since Column 7 shows that students who received aid packages with no dominant source attended institutions with 13.0% higher prices than students who received no financial aid.

Effects of Academic Characteristics Upon Institutional Tuition and Fees

Tables 7 and 8 also show that, even after controlling for institutional characteristics, socioeconomic status, financial aid, and race, students with higher SAT/ACT scores attended higher price institutions than students with lower test scores. Each 100 point increase in student SAT score was associated with a 5.7% to 6.0% increase in the price of institution attended, depending upon the way in which financial aid was operationalized. Student SAT/ACT score was the third most important predictor of price of institution attended after institutional control and institutional location. Remedial instruction was not statistically significant in any of the models and, therefore, was excluded from the final regression models. Academic self-confidence had a statistically significant (t-value of 2.23) positive effect upon price when financial aid was measured as the package of aid received and was marginally significant (t-value ranging from 1.63 to 1.78) when financial aid was measured in other ways.

Effects of Socioeconomic Status Upon Institutional Tuition and Fees

After controlling for academic characteristics, institutional characteristics, race, and financial aid, freshmen in the two lower socioeconomic status quartiles attended lower price institutions than freshmen with higher socioeconomic status. The relationship between socioeconomic status and price of institution was not linear, as evidenced by the similarity of the regression coefficients for freshmen in the two lower socioeconomic status quartiles. Relative to students in the two upper socioeconomic status quartiles, those in the lowest quartile attended institutions with 13.1% to 18.8% lower tuition and fees and students in the second lowest quartile attended institutions with 13.1% to 16.4% lower tuition and fees. Students in the third and highest socioeconomic status quartiles attended institutions with comparable prices, on average, after other differences (e.g., institutional control and location, SAT score, race, and financial aid) between the students were controlled. Interactions between financial aid and socioeconomic status quartile were not related to institutional price, and, therefore, were excluded from the final regression models.

Effects of Race Group Upon Institutional Tuition and Fees

After controlling for academic characteristics, institutional characteristics, race, and financial aid, Hispanic freshmen attended lower price institutions than freshmen of other race groups. Depending upon the way in which financial aid was measured, Hispanics attended institutions that charged between 41.0% and 50.1% lower tuition and fees than students of other race groups.

As evidenced by the statistically significant interactions shown in Columns 3 and 5, the effects of financial aid upon institutional price varied by race group. Tables 7 and 8 show that, on average, students who received aid packages comprised of only loans (column 3), any amount of loans (column 4), or primarily loans (column 5) attended higher price institutions than other students. But, packages

comprised of only loans or predominantly of loans were less effective in enabling black students than students of other race groups to attend higher price institutions. The interaction between receiving loans and Hispanic was marginally significant (t-value = 1.78) and positive, suggesting that loans may have a stronger positive effect upon institutional price for Hispanics than for students of other race groups.

CONCLUSIONS AND DIRECTIONS FOR FUTURE RESEARCH

Descriptive and multivariate analyses were used to examine the relationship between financial aid and the price of institution attended by 1989/90 dependent, full-time, first-time freshmen who were enrolled at the institution of their first choice. The relationship was examined after controlling for such factors as institutional control and location, SAT score, socioeconomic status, and race, all of which were found in prior research to be related to institutional choice. The three purposes of this section are: 1) to present the conclusions that emerged from the descriptive and multivariate analyses; 2) to evaluate the analyses from both statistical and policymaker perspectives; and 3) to identify directions for future research.

Conclusions

Four conclusions may be drawn from the descriptive and multivariate analyses. First, financial aid enabled students to attend higher price institutions, although various types and amounts of aid had different effects upon the price of institution attended. Second, unlike prior research, the analyses in this dissertation showed that loans were positively related to the price of the institution attended. Third, financial aid was insufficient to enable students with lower socioeconomic status and Hispanic students to attend the higher price four-year colleges and universities for which they were academically qualified.

Fourth, the effects of financial aid upon institutional price varied by race group, since loans were less effective for black students than for students of other race groups.

Financial Aid Enabled Students to Attend Higher Price Institutions

The descriptive and multivariate analyses used in this dissertation show that financial aid promotes student choice by enabling students to attend higher price institutions. Descriptive analyses showed that 1989/90 dependent, first-time, full-time freshmen who attended their first-choice four-year institution and who received financial aid chose 26.3% higher price institutions than their counterparts who did not receive aid ($4,998 versus $3,957). Even after controlling for other factors related to institutional price, such as institutional characteristics, SAT score, race, and socioeconomic status, freshmen who were attending their first choice four-year institution and who received financial aid chose four-year institutions with 13.1% higher prices than freshmen who were attending their first choice institution and who did not receive financial aid.

The analyses also showed that the effect of financial aid upon institutional price depended upon the amount of aid awarded. Receiving financial aid that covered 25% or less of the cost of attendance was more effective in enabling students to attend higher price institutions than not receiving financial aid, but less effective than aid that covered 25% to 75% of the costs of attendance. But, receiving financial aid that covered more than 75% of the costs of attendance had no affect upon the price of institution attended. This suggests that financial aid does not necessarily enable students to attend higher price institutions, but that students must supplement financial aid with other financial and personal resources in order to attend America's most expensive institutions.

Loans were Positively Related to Price of Institution Attended

Unlike prior research, the analyses presented in this paper show that loans enabled students to attend higher price institutions. Descriptive analyses showed that the most popular aid package received by 1989/90 dependent full-time, first-freshmen who attended their first choice four-year institution was comprised of only grants. While 20.3% received packages comprised of only grants, only 16.5% received packages of grants and loans, 8.2% received packages of grants, loans, and work study, and 5.4% received packages of only loans. But, freshmen who received aid packages comprised of grants, loan, and work study ($7,466) or grants and loans ($5,155) were observed to attend higher price institutions than freshmen who received packages comprised of only grants ($4,542) or only loans ($4,213). The observed relationships suggest that packages of financial aid that included both grants and loans were more effective in enabling students to attend higher priced institutions than packages that included only grants or only loans.

But, after controlling for socioeconomic status, academic ability, and other institutional characteristics, an aid package comprised of only loans had a larger positive effect upon the price of the institution attended than other packages of aid. Receiving a loan of any amount and receiving an aid package comprised primarily of loans were also associated with attending higher priced institutions. Compared with those who did not receive financial aid, freshmen who received aid packages comprised of only loans attended institutions with 33.2% higher prices, freshmen who received packages that included loans attended institutions with 22.1% higher prices, and freshmen who received packages that emphasized loans attended institutions with 18.4% higher prices.

In contrast, after controlling for institutional control and location, SAT score, race, and socioeconomic status, students who received only grants and students who did not receive financial aid attended institutions with comparable prices. Freshmen who received grants attended higher priced

institutions than students who did not receive financial aid only if they also received loans or if grants comprised more than 50% of the total aid awarded. On average, after controlling for other factors, freshmen who received aid packages that emphasized grants attended institutions with 10.6% higher prices than freshmen who did not receive aid.

The positive effect of loans upon price found in this study differs from the findings of prior researchers. For example, researchers (Nolfi, et al., 1978; Tierney, 1980) who examined choice of institution to attend among high school seniors in the 1970s, when federal financial aid programs were in their infancy, generally found that grants, loans, and work study had comparable-sized, positive effects upon choice. Researchers (Schwartz, 1985; Chapman and Jackson, 1987; Jackson, 1990; Moore, et al., 1991) who have examined choice among students in the early 1980s have found that grants, but not loans, promote choice.

The influence of particular types of financial aid upon institutional choice may reflect the characteristics of the financial aid programs in place at the time of the study. In 1972/73, only 25.8% of all aid awarded to postsecondary students was funded from federal loans (Guaranteed Student Loans and Perkins Loans) and 8.6% from federal need-based grants (Pell, SEOG, and SSIG). In 1981/82, federal loans comprised 44.3% of all financial aid and federal need-based grants comprised 15.5% of all aid. By 1989/90, 47.8% of all financial aid was awarded from federal loan programs and 19.3% from federal need-based grant programs (The College Board, 1996). These patterns suggest that the shift in the emphasis of federal financial aid policy from grants to loans has not deterred students from attending the higher priced institutions for which they are academically qualified.

Lower Socioeconomic Status and Hispanic Students Attended Lower Price Institutions

Despite receiving financial aid, students with lower socioeconomic status and Hispanic students attended lower price institutions than students with higher socioeconomic status and students of other race groups. Descriptive analyses reveal that, even though 76.6% of 1989/90 dependent freshmen in the lowest socioeconomic status (SES) quartile received financial aid, these freshmen attended institutions with 42.9% lower prices than freshmen in the highest quartile ($3,585 versus $6,281). Although 73.3% of Hispanic freshmen received financial aid, they were observed to attend institutions with 27.8% lower prices than white freshmen ($3,363 versus $4,657). Even after controlling for institutional control and location, SAT score, and financial aid, students in the two lower SES quartiles attended institutions with 13.1% to 18.8% lower prices than students in the two upper SES quartiles and Hispanics attended institutions with 41.0% to 50.1% lower tuition and fees than freshmen of other race groups.

Descriptive analyses showed that black freshmen attended 29.7% lower priced institutions than white freshmen ($3,276 versus $4,657). But, black freshmen and white freshmen attended institutions with comparable prices after controlling for other differences, such as institutional characteristics, SAT score, socioeconomic status, and financial aid. Therefore, the multivariate analyses in this study indicate that financial aid eliminated the barriers to high price institutions that black freshmen face.

Conrad and Cosand (1976) asserted that the success of federal policy in achieving the goal of student choice among different types of postsecondary education institutions may be measured as the extent to which students with different characteristics are evenly dispersed among various types of postsecondary institutions. One may argue that the success of the policy depends only upon the extent to which student financial aid programs provide equal educational opportunity for all academically qualified citizens regardless of their economic status, where equal educational opportunity is defined as choice among the variety of American postsecondary educational institutions. The results of this study

show that the goal of student choice was not achieved among 1989/90 freshmen. While financial aid generally enabled 1989/90 dependent, full-time freshmen to attend higher price institutions, students in the two lower socioeconomic status quartiles and Hispanic students were still less likely than students with higher socioeconomic status and students of other race groups to attend higher price institutions.

The Effects of Financial Aid Upon Institutional Choice Varied by Race Group

The multivariate analyses presented in this dissertation show that the effects of financial aid upon institutional price varied by race group. Relative to 1989/90 dependent, first-time, full-time freshmen who did not receive financial aid, those who received loans attended institutions with 22.1% higher prices, those who received aid packages that included only loans attended institutions with 33.2% higher prices, and those who received aid packages dominated by loans attended institutions with 18.4% higher prices. But, as shown by the negative interactions between receiving an aid package comprised of only loans and being black, and between receiving an aid package that emphasized loans and being black, the positive effects of loans upon institutional price were smaller for blacks than for students of other race groups. The positive interaction between receiving loans and Hispanic was marginally significant suggesting that, although Hispanics generally attended lower price institutions than freshmen of other race groups, Hispanics who borrowed may attend higher price institutions than Hispanics who did not borrow.

Evaluation of the Models

In order to assess the contribution of this study to our knowledge of the effects of financial aid upon institutional choice, the analyses must be evaluated. The analyses are evaluated from two

perspectives: a statistical methods perspective and a public and higher education policymaker's perspective.

Statistical Perspective

From a statistical methods perspective, the model used for the multivariate analyses presented in this dissertation has several strengths. First, the independent variables included in the regression models explained approximately two-thirds (63.2% to 64.3%) of the variance in institutional price for freshmen who were attending their first choice institution. Therefore, although some of the variables predicted by prior research to be related to institutional choice, such as high school characteristics, parental encouragement, and labor market expectations, were omitted from the model because they were not available in the BPS database, these omissions appear to have had minimal effect upon the model.

A second strength of the statistical analyses pertains to the testing of interactions between financial aid and race group upon institutional price. Unlike prior research, the multivariate analyses in this dissertation demonstrate that the effects of financial aid upon institutional price may vary by race group. Although researchers (e.g., Jackson, 1978; Schwartz, 1986; Seneca and Taussig, 1987; Leslie and Brinkman, 1988; Healy, 1991) have shown that the effects of financial aid vary by socioeconomic status, this dissertation has shown that, race group, but not socioeconomic status, interacts with financial aid to influence institutional price.

Public and Higher Education Policymaker Perspective

From a policymaker perspective, the analyses presented in this study have three strengths. First, this study demonstrates the importance of periodically examining the effects of financial aid upon institutional choice. Unlike prior research, the findings from this study show that loans promote choice,

but that loans are less effective in promoting choice for blacks than for students of other race groups. In addition, current financial aid policies do not enable Hispanic students and students of lower socioeconomic status to attend the higher price institutions for which they are academically qualified.

Second, the descriptive and multivariate analyses demonstrate the need to consider more than whether students received or did not receive financial aid. Different dimensions of financial aid, such as the types, sources, combinations, and amounts of different types and sources of aid, must also be considered. For example, the analyses presented in this study showed that grants enabled students to attend higher price institutions only when they were combined with loans and/or they represented 50% or more of the financial aid package.

Third, these analyses are useful not only to federal policymakers, but also to financial aid directors at higher education institutions. By considering not only the effects of receiving financial aid, but also the effects of different types, sources, and combinations of financial aid, these analyses provide insights into the varying effectiveness of different financial aid packaging policies. For instance, while simply receiving institutional financial aid was not associated with attending a higher price institution, receiving an aid package that emphasized institutional aid was positively related to the price of institution attended.

For policymakers, the primary weakness of these analyses is that only one phase of the college choice process is examined: the characteristics of the actual institution attended. According to Hossler and Gallagher (1987), the college choice process is comprised of three stages: 1) predisposition or interest in attending any college, 2) search for information about college characteristics and selection of institutions to which to apply, and 3) decision of which college or university to attend. Therefore, the descriptive and multivariate analyses presented in this study do not investigate the ways in which financial considerations and financial aid influenced students' interest in attending college or their

selection of institutions to which to apply. Moreover, because the data were not available in the BPS database, the analyses do not consider the characteristics of institutions among which students were choosing. Consequently, the multivariate analyses do not reveal whether Hispanics and students of lower socioeconomic status attended lower price institutions than other students because they had applied to and were accepted to higher price institutions but felt they could not afford higher price institutions even with financial aid, or if they attended lower price institutions because they had not even applied to higher price institutions because of their financial concerns.

Directions for Future Research

Future research should be conducted to build upon the strengths and to address the limitations of this study. Specifically, future research should focus upon three areas: 1) differences in the institutions students of different race groups choose to attend; 2) race group differences in the effects of financial aid upon choice; and 3) changes in the influence of financial aid over the course of the college choice process, with attention to the characteristics of the institutions considered.

Differences in the Institutions Chosen by Students of Different Race Group

Although this dissertation compares the experiences of black, Hispanic, and white students, the use of broad race groups, particularly for Hispanics, necessarily masks the diversity of student experiences within these categories. Moreover, because of the relatively small representation of Asian American/Pacific Islanders (2.5%) and American Indian/Alaskan Natives (0.8%) in the sample, the college choices of these groups were not examined. Further research is necessary, not only to better understand the experiences of students of different race groups, but also to understand the factors that restrict the institutional choices of Hispanic and lower socioeconomic students.

Hispanic students and students of lower socioeconomic status may be less likely to attend higher price institutions because they have higher assessments of non-monetary risks and/or they perceive restricted future labor market opportunities. According to the consumer choice theory, a modification of econometric decision making models, educational decisions are a function of the personal resources required, including monetary and non-monetary effort and monetary and non-monetary risk, and are calculated relative to personal resources (Young and Reyes, 1987). Since financial aid addresses only monetary costs of attendance, the consumer choice model predicts that educational choices will reflect differences in perceived non-monetary costs, differences that reflect cultural, social, and psychological factors as well as types and sources of information available (Young and Reyes, 1987). Examples of non-monetary risks include the social and psychological risks of not completing the educational program, the social adjustments associated with entering a new environment, and the loss of contact with family and friends. Future research should focus upon understanding the non-monetary risks that Hispanic students and students of lower socioeconomic status associate with attending higher price institutions and the ways in which their calculations of non-monetary risks differ from the calculations of other students.

Additionally, according to the dual labor market theory, Hispanic students and students of lower socioeconomic status may perceive less attractive opportunities after college graduation due to race and sex discrimination in the labor market (Gardner, 1987). This theory predicts that, if occupational aspirations depend upon expected labor market opportunities and if occupational aspirations affect educational choices, then those who expect fewer opportunities because of their race or sex will make educational choices that reflect these perceived limitations (Gardner, 1987). Further research is required to understand the labor market opportunities that Hispanic students and students of lower socioeconomic status expect, the ways in which these perceived opportunities differ from those of other students, and the ways in which students' expectations influence their choice of college or university to attend.

Race Group Differences in the Effects of Financial Aid Upon Choice

Further research is also needed to determine why loans were less effective in enabling black students than students of other race groups to attend higher price institutions. One possible explanation is that black students are more averse to borrowing than students of other race groups. The positive relationship between loans and institutional price shows that, under existing financial aid policies and practices, students must be willing to borrow in order to attend the nation's higher price colleges and universities. But, Ekstrom (1991) found that, after controlling for background characteristics, locus of control, achievement, educational aspirations, encouragement of significant others, knowledge about college costs and financial aid, and preference for various institutional characteristics, students with higher socioeconomic status, higher educational aspirations, and greater knowledge of college costs exhibited greater willingness to borrow to pay the costs of their undergraduate education. Other researchers (e.g., Steelman and Powell, 1980; Olson and Rosenfeld, 1984) have also shown that willingness to borrow increases with income. Olson and Rosenfeld (1984) showed that, on average, parents of 1980 high school sophomores and high school seniors who had lower incomes were less willing than parents who had higher incomes to borrow to pay the costs of their child's postsecondary education. About 60% of families with incomes less than $10,000 were willing to go into debt compared with 72% of families with incomes over $40,000 (Olson and Rosenfeld, 1984). Similarly, Steelman and Powell (1980) found that, among those who responded to the High School and Beyond Parent Survey, willingness to borrow for the child's education increased with family income, level of education, and educational aspirations for the child and decreased with the number of children in the family after controlling for parental and student characteristics. Therefore, future research should

examine the extent to which aversion to borrowing limits the effectiveness of loans upon the price of institution attended for black students.

Changes in the Influence of Financial Aid over the Course of the College Choice Process

A longitudinal study of the factors that influence choice of institution to attend is necessary to address three of this dissertation's limitations: the use of cross-sectional data to examine the effects of financial aid upon students' choice of institution to attend, the failure to consider characteristics of the institutions from which students were choosing, and the failure to examine the effects of financial aid upon students' application decisions. In the absence of longitudinal data, the causal order of perceptions, preferences, and choice cannot be ascertained. Moreover, some evidence (Spies, 1973; Manski and Wise, 1983; Spielvogel, 1992; Ozden, 1993) suggests that income and financial aid may have a greater effect upon the selection of institutions to which to apply than upon the choice of institution from those accepted to attend. A longitudinal study would capture the effects of financial aid and financial concerns upon the early stages of the college choice process, monitor changes in the effects of financial aid and financial concerns over time, and collect the data necessary to control for some of the variables that were unavailable in the BPS database, including the characteristics of the institutions among which students were choosing (e.g., price, selectivity, and location), high school achievement (e.g., high school rank, high school grades), high school quality (e.g., percent minority, average SAT score, percent going to college), high school experiences (e.g., curricular track, extracurricular activities), encouragement of significant others, and labor market expectations.

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